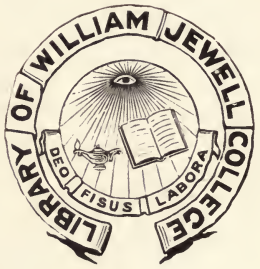
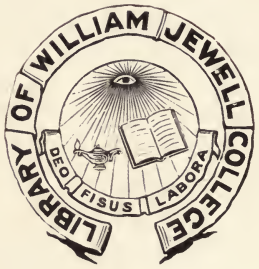


7482

From the collection of the

San Francisco, California
2006



7482

From the collection of the

San Francisco, California
2006

65TH CONGRESS : : : 3D SESSION

DECEMBER 2, 1918–MARCH 4, 1919

HOUSE DOCUMENTS

VOL. 13

WASHINGTON : : GOVERNMENT PRINTING OFFICE : : 1919

7482

HOUSE DOCUMENTS

Vol. 13

65TH CONGRESS, 3d Session | HOUSE OF REPRESENTATIVES | DOCUMENT No. 1768

CAPE COD CANAL

LETTER FROM THE SECRETARY OF WAR

TRANSMITTING

REPORT OF PROCEEDINGS TO DATE IN DETERMINING VALUE AND ADVISABILITY OF PURCHASE OF THE CAPE COD CANAL, CONNECTING BUZZARDS BAY AND CAPE COD BAY, MASS.

FEBRUARY 6, 1919.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustrations

WASHINGTON
GOVERNMENT PRINTING OFFICE
1919

65th CONGRESS, 3d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 1768.

CAPE COD CANAL.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

REPORT OF PROCEEDINGS TO DATE IN DETERMINING VALUE AND ADVISABILITY OF PURCHASE OF THE CAPE COD CANAL, CONNECTING BUZZARDS BAY AND CAPE COD BAY, MASS.

FEBRUARY 6, 1919.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustrations.

WAR DEPARTMENT,
Washington, February 5, 1919.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: The river and harbor act of August 8, 1917, directed that an investigation, in the nature of a preliminary examination and survey, be made of the Cape Cod Canal, connecting Buzzards Bay and Cape Cod Bay, Mass., for the purpose of determining its value and the advisability of its purchase and enlargement by the United States. The required investigation was conducted under the supervision of the Chief of Engineers, and the results are embodied in his report dated July 31, 1918, and appurtenant reports by the division engineer and the Board of Engineers for Rivers and Harbors.

In compliance with a further requirement of the act these reports have been given very careful consideration by myself and associates, the Secretary of the Navy, and the Secretary of Commerce. After mature study of the data presented in the reports, and further extended inquiry into the questions of costs and values, we reached the conclusion that it was desirable for the Government to buy the canal, and that $8,250,000 was a fair and reasonable price to pay for it. I then entered into negotiations with the owners of the canal with a view to contracting for its purchase, and offered them the sum of $8,250,000, which offer they declined to accept. Convinced of my inability to make a satisfactory contract of purchase, I have asked the Attorney General to institute proceedings to condemn the canal and its appurtenances as provided in the act.

30939

Inasmuch as condemnation proceedings may extend over a considerable period of time before an award can be made and the entire matter laid before Congress, in exact accordance with the provision of the act of August 8, 1917, I desire to submit a report of proceedings up to date supported by pertinent papers upon which the conclusions so far reached are based.

The Railroad Administration has been operating the Cape Cod Canal since July 25, 1918. During this time the canal has not only been maintained in as good condition as when it was taken over from its owners, but has been materially improved. The amount of traffic through the canal for part of the year 1917 and the corresponding part of the year 1918 are as follows:

Operations through Cape Cod Canal.

Month.	1918			1917		
	Vessels.	Vessel tonnage.	Cargo tonnage.	Vessels.	Vessel tonnage.	Cargo tonnage.
August	580	531,725	170,529	450	407,129	92,670
September	600	540,896	226,904	364	401,940	87,702
October	542	476,362	192,639	317	355,277	92,048
November	563	351,672	180,991	266	182,575	94,015
December	417	315,212	153,621	184	78,533	29,057
Total	2,602	2,215,867	924,684	1,581	1,425,454	395,492

INCREASES 1918 OVER 1917.

Number of vessels	1,021
Per cent	64.6
Vessel tonnage	790,413
Per cent	55.4
Cargo tonnage	529,192
Per cent	134

The above data give an indication of the increase of traffic through this canal that may be expected to develop if title to the canal is obtained by the United States, the canal improved so as to render navigation through it easy and safe, and freed of toll charges.

Very respectfully,

NEWTON D. BAKER,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, July 31, 1918.

From: The Chief of Engineers, U. S. Army.
To: The Secretary of War.
Subject: Preliminary examination and survey of Cape Cod Canal, Mass.

1. There are submitted herewith for the action of the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce, reports dated January 25, 1918, and April 4, 1918, with maps and

appendixes, by Brig. Gen. William T. Rossell, U. S. Army, retired, on preliminary examination and survey, respectively, authorized by the following item contained in the river and harbor act approved August 8, 1917:

Waterway connecting Buzzards Bay and Cape Cod Bay, Mass.: The Secretary of War, the Secretary of the Navy, and the Secretary of Commerce are hereby authorized to examine and appraise the value of the works and franchises of the Cape Cod Canal, Mass., connecting Buzzards and Cape Cod Bays, with reference to the advisability of the purchase of said canal by the United States and the construction over the route of the said canal of a free waterway, with or without a guard lock, and having a depth and capacity sufficient to accommodate the navigation interests that are affected thereby. This investigation shall be conducted under the direction of the Secretary of War and the supervision of the Chief of Engineers in the usual manner provided by law for making preliminary examinations and surveys except that the Secretary of War shall call upon the Secretary of the Navy and the Secretary of Commerce for such data and evidence as these Secretaries may wish to have incorporated in the report of survey, and, further, that the final report of the investigation, with its conclusions upon probable cost and commercial advantages and military and naval uses of the said canal, shall be submitted to the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce for their action before it is transmitted to Congress.

If the said Secretaries are all in favor of the acquisition of the said canal, the Secretary of War is hereby further authorized to enter into negotiations for its purchase, including all property, franchises, and appurtenances used or acquired for use in connection therewith or appertaining thereto; and he is further authorized, if in the judgment of the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce, that the price for such canal is reasonable and satisfactory, to make contracts for the purchase of the same, at the option of the United States, subject to future ratification and appropriation by the Congress; or, in the event of the inability of the Secretary of War to make a satisfactory contract for the voluntary purchase of said Cape Cod Canal and its appurtenances, he is hereby authorized and directed, through the Attorney General, to institute and carry to completion proceedings for the condemnation of said canal and its appurtenances, the acceptance of the award in said proceedings to be subject to the future ratification and appropriation by Congress. Such condemnation proceedings shall be instituted and conducted in, and jurisdiction of said proceedings is hereby given to, the district court of the United States for the district of Massachusetts, substantially as provided in "An Act to authorize condemnation of land for sites for public buildings, and for other purposes," approved August first, eighteen hundred and eighty-eight; and the sum of $5,000 is hereby appropriated to pay the necessary costs thereof and expenses in connection therewith. The Secretary of War is further authorized and directed to report the proceedings hereunder to Congress.

2. The question of constructing a canal between Cape Cod Bay and Buzzards Bay has been considered at various times since the early history of the Plymouth colony, but effective operations toward this end were not undertaken until the issue of a charter to the Boston, Cape Cod & New York Canal Co. by the Commonwealth of Massachusetts on June 1, 1899. The canal has been in partial or full operation since 1914, and on January 25, 1918, the Waterways and Public Lands Commission of the State of Massachusetts declared it completed in substantial accord with the provisions of the charter. The canal is 8 miles long between shore lines and extends 4½ miles into Buzzards Bay and one-half mile into Barnstable or Cape Cod Bay. The plans provide for a depth of 25-feet at mean low water, with bottom widths of 100 to 300 feet, the 100-foot width being through a stretch of 6 miles of land cut, increasing to 250 feet in the westerly end and 300 feet in the easterly end. The Buzzards Bay or western end of the canal is landlocked and requires no artificial protection, but the easterly end is exposed, and a jetty 3,000 feet long has been constructed on the northerly side and a short jetty or sand catch on the southerly side of the entrance. The mean range of tide in

Buzzards Bay is about 5 feet and in Cape Cod Bay it is nearly 10 feet, so that at high water the depth varies from about 30 feet at the westerly end to about 35 feet at the easterly end. The charter gives the company the right to charge tolls.

3. The canal is used by a large number of vessels engaged in general commerce and in handling coal by tows. It is reported that during 1916, 4,589 vessels of 3,611,939 gross tonnage passed through the canal, and it is estimated that during this period 13,500 commercial vessels of 15,167,998 gross tonnage (not cargo tonnage) went around the cape.

4. Estimates of the cost of enlarging the canal have been given by the division engineer as follows:

(*a*) Canal 200 feet bottom width, 25 feet depth at mean low water, approaches 300 feet wide	$2,603,256
(*b*) Canal 30 feet deep, other dimensions as above	4,983,381
(*c*) Canal 35 feet deep, other dimensions as above	6,919,819
(*d*) Canal 40 feet deep, other dimensions as above	9,684,211

The cost of a guard lock, should one be required, is roughly estimated in the report on survey at about $5,000,000 and no detailed estimates of cost can be given in the absence of a decision as to the precise requirements to be met. The division engineer is of opinion that rather than to build a lock in the canal it would be better to suspend navigation in times of greatest velocities. The cost of a detached breakwater in Cape Cod Bay, also of doubtful necessity, is estimated at about $6,000,000 to $10,000,000, depending upon its length and the depth of water in which it is located. The least length of breakwater tentatively suggested is 1 mile, and estimates are given ranging from $6,025,900 for a structure of this length to $10,231,687.50 for one 9,000 feet in length.

5. Consideration has been given by the division engineer to the question of the value of the works and franchises of the canal, and in connection with his study of this subject, he has had an examination made of the records of the Boston, Cape Cod & New York Canal Co., and of the Cape Cod Construction Co., by a firm of certified public accountants, whose findings are contained in Appendix A of his report on the survey. After consideration of all the data available, he reaches the conclusion that from a military as well as a commercial point of view the value of the canal is very large and that it would be well worth to the United States the actual cost of construction, provided this were not too great. In his opinion the price to be paid, if it be decided to purchase the canal, should not exceed $8,265,743.04, which is the figure given in Appendix A. as the total cash cost of construction, including both direct and indirect costs.

6. These reports have been referred, as required by law in the case of all preliminary examinations and surveys, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated May 29, 1918, and to its supplemental report of July 24, 1918. The board indicates that, while the most general criticism of the canal relates to its narrowness, a depth of 30 feet with a minimum bottom width of 200 feet is generally desired, and many advocate a depth of 35 feet. The board's study of the question leads it finally to the conclusion that a depth of 30 feet and a minimum bottom width of 200 feet are advisable. While the tidal currents are of sufficient strength to affect quite decidedly the progress of all vessels,

especially tows, the board finds that the great preponderance of opinion is adverse to the construction of a guard lock, and the majority of navigators prefer to put up with the swift currents rather than to have the annoyance and delay that would be occasioned by a lock. The board is of opinion that the question of a guard lock can therefore be dismissed from consideration at this time. If one should be found to be necessary hereafter, it could be constructed then as well as now. With reference to the construction of a detached breakwater at the easterly entrance, the board reaches the conclusion that such a breakwater is not necessary or advisable.

7. The board has given careful study to the financial statements contained in Appendix A of the report on survey, from which it appears that the direct cost of actual construction amounted to $6,243,171.01, the indirect cost to $1,274,459.63, and the interest and taxes during construction to $748,112.40, thus giving a total cost of construction amounting to $8,265,743.04, not including amounts paid in capital stock for rights and franchises or for services in promotion, organization, engineering, financing, etc., nor discount on securities, loss or deficit on operations, and damage claims, amounting in all to $4,787,410.67. The total expenditures on the canal (see Exhibits E and EE of Appendix A) are thus reported to be $13,053,153.71 up to August 31, 1917, counting the payments with stock and bonds at par. The board believes that the sum of $8,265,743.04 may be properly included in toto in determining a fair and reasonable estimate of the cost of the canal, and that reasonable allowance for the rights of way and franchises and for the development expenses in building up a traffic, warrants appraising the fair cost of the canal in round numbers at $10,000,000, as based upon the reported expenditures. It is not convinced, however, that an investment of this amount is justified on the part of the United States in order to make this a free waterway. The information submitted indicates that the claimed advantages of this route over the outside one around Cape Cod have diverted from the latter only about one-fifth of its tonnage and that the saving to be effected by the canal would not warrant an expenditure equal to the cost of its construction. The board places at $2,500,000 the upper limit of any justifiable expenditure by the United States to acquire public ownership if commercial uses alone are considered.

8. The board states that the canal would doubtless have some military value as a transportation route for moving supplies, but its value as affecting strictly military land operations is deemed of comparatively slight importance. The best information available to the board respecting the naval value of the canal is contained in a memorandum accompanying a letter of August 19, 1916, from the General Board of the Navy, which was approved by the Joint Board of the Army and Navy when considering the improvements required for the operations of the fleet of defense, as reported in House document No. 140, Sixty-fifth Congress, first session. From this memorandum it appears that the General Board was of the opinion that the considerable expenditure required for enlarging the canal sufficiently to make it available for all classes of naval vessels, and the even greater expenditure for the defenses that should be given an important military waterway at a salient of the coast, were not warranted by the apparent increased military advantage of such a waterway The

Board of Engineers for Rivers and Harbors states that it has no data upon which it can assign a definite value to the canal for Government uses. The calculable money value of public ownership for any uses that can be made of the present canal by Federal agencies in normal times would be due to the saving of tolls on Government vessels. The capitalized value of these tolls could hardly exceed $1,000,000, thus giving a total value of public ownership, as thus computed for direct benefits, of not exceeding $3,500,000.

9. From information given the board at its second hearing it appears that the canal is not a financial success as a private enterprise, that it is not efficiently maintained to project dimensions, and that these dimensions are inadequate for the demands of commerce. The general consensus of the views expressed is in favor of a depth of 30 feet and a bottom width of 200 feet, and the board recommends such enlargement if the canal is acquired by the United States. In view of the general sentiment in favor of the acquisition of the canal by the United States, as the only means of providing and maintaining an efficient waterway, the board, in its supplemental report, recommends such acquisition, including all property, franchises, and appurtenances used or acquired for use in connection therewith or appertaining thereto, provided this can be accomplished at a price which is reasonable in view of the public benefits to result from public ownership. In the board's opinion, this value does not exceed $3,500,000, as stated above, especially in view of the large additional expenditures that must be made to provide adequate facilities.

10. A sheltered connection between the waters of Long Island Sound and Boston forms a part of the general conception for the intracoastal canal system contemplated by Congress in the river and harbor act of March 3, 1909. The report on the Boston-Beaufort section called for by this act is found in House Document No. 391, Sixty-second Congress, second session. From this report it will be seen that coastwise traffic between Long Island Sound and the New England ports to the East and North is exposed to losses due to peril from the sea immediately after passing through the Race south of Fishers Island; that a practicable canal route is available from Fishers Island Sound to Narragansett Bay and at least two available routes from Narragansett Bay to Massachusetts Bay; that the opening of a canal through Cape Cod forms only a partial solution of the problem presented in that it permits avoidance of the passage around Cape Cod only, without affording shelter in Massachusetts Bay or in the approaches to Buzzards Bay.

11. The special board making that investigation found that the commercial conditions then existing did not warrant the construction of a canal between Narragansett Bay and Massachusetts Bay as a profitable investment by the United States. The Cape Cod Canal was then under construction by a private corporation. Its purchase by the United States was considered by the board, which recommended adversely, stating "The economic value of the Cape Cod Canal, with its exposed approaches, has not yet been established. It is not considered advisable for the United States to enter into any negotiations looking to the acquisition of the canal at the present time. After its completion the question of acquirement based on its value as a 'going concern' may be worthy of further consideration."

12. The canal was begun to be operated commercially in 1914, and was completed in the spring of 1916. As yet it is not financially successful, the operating costs largely exceeding the revenue from tolls. The canal management now admit their inability to maintain the project dimensions.

13. From the reports and the testimony taken it is evident that the Cape Cod Canal is useful and valuable, but that its use is limited and its value decreased by having too small a cross section. Due to differences in the times and ranges of the tides in Cape Cod (Massachusetts) Bay and Buzzards Bay, marked tidal currents are developed in the canal, which increase the difficulties of navigation. The effect on such currents of an increase in cross section is discussed in the report of survey. This discussion shows that the proposed increase in cross section will not increase current velocities unduly. The factor of change in the movement and height of the tidal wave itself caused by the increased cross section is not known, and its effect, in the existing limitations of knowledge of the subject, can not be foretold with accuracy. Reasoning by analogy, however, it may be said that this factor will tend to equalize conditions, and that the current velocities computed in the report of survey probably represent maximum velocities and that the increase of cross section will markedly increase the value of the canal.

14. Considering the various parts of the intracoastal canal project, it is my belief that the opening of other portions of the canal route would give greater commercial relief than that obtainable by the Cape Cod Canal, and therefore, that if the annual investment by the United States in such work is to be limited, other portions of the project should be given priority. On the other hand, the Cape Cod Canal is to-day much nearer completion to the stage desirable for operation than are other portions of the route, and the evidence shows that unless the United States should intervene and operate the canal, deterioration of the channel will continue and its consequent commercial utility will decrease. In the existing emergency, war risks make continued use of the canal necessary and its improvement desirable; therefore its early purchase is deemed advisable.

15. Since the canal has an economic value to the United States beyond that based on a calculation of probable saving on the traffic, it is difficult to fix accurately the price which should be paid. In my opinion, however, this should be as nearly as practicable the amount it would have cost the United States to have done the work. This probably would have been about the amount named by the board as the fair value based on cost of construction, viz, $10,000,000.

16. I therefore report that the acquisition of the Cape Cod Canal, Mass., by the United States is deemed advisable, provided this can be accomplished at a cost not exceeding $10,000,000; and that if the canal is acquired it should be enlarged to a depth of 30 feet at mean low water and a minimum bottom width of 200 feet, at an estimated cost of $5,000,000. It is recommended that an initial appropriation of $2,000,000 be provided for this work, if a satisfactory agreement for the purchase of the canal can be reached. The above recommendations are based mainly on commercial needs and upon the naval views expressed by the General Board of the Navy

in 1916. If the naval requirements have changed in this respect in the meantime, these requirements may warrant some modification of the above conclusions.

W. M. BLACK,
Major General.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

[Second indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
May 29, 1918.

The CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The following is in review of the division engineer's reports on preliminary examination and survey authorized by the following item contained in the river and harbor act of August 8, 1917:

Waterway connecting Buzzards Bay and Cape Cod Bay, Massachusetts: The Secretary of War, the Secretary of the Navy, and the Secretary of Commerce are hereby authorized to examine and appraise the value of the works and franchises of the Cape Cod Canal, Massachusetts, connecting Buzzards and Cape Cod Bays, with reference to the advisability of the purchase of said canal by the United States and the construction over the route of the said canal of a free waterway, with or without a guard lock, and having a depth and capacity sufficient to accommodate the navigation interests that are affected thereby. This investigation shall be conducted under the direction of the Secretary of War and the supervision of the Chief of Engineers in the usual manner provided by law for making preliminary examinations and surveys except that the Secretary of War shall call upon the Secretary of the Navy and the Secretary of Commerce for such data and evidence as these Secretaries may wish to have incorporated in the report of survey, and further, that the final report of the investigation, with its conclusions upon probable cost and commercial advantages, and military and naval uses of the said canal, shall be submitted to the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce for their action before it is transmitted to Congress.

If the said Secretaries are all in favor of the acquisition of the said canal, the Secretary of War is hereby further authorized to enter into negotiations for its purchase, including all property, franchises, and appurtenances used or acquired for use in connection therewith or appertaining thereto; and he is further authorized, if in the judgment of the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce that the price for such canal is reasonable and satisfactory, to make contracts for the purchase of the same, at the option of the United States, subject to future ratification and appropriation by the Congress; or, in the event of the inability of the Secretary of War to make a satisfactory contract for the voluntary purchase of said Cape Cod Canal and its appurtenances, he is hereby authorized and directed, through the Attorney General, to institute and carry to completion proceedings for the condemnation of said canal and its appurtenances, the acceptance of the award in said proceedings to be subject to the future ratification and appropriation by Congress. Such condemnation proceedings shall be instituted and conducted in, and jurisdiction of said proceedings is hereby given to, the district court of the United States for the district of Massachusetts, substantially as provided in "An Act to authorize condemnation of land for sites for public buildings, and for other purposes," approved August first, eighteen hundred and eighty-eight; and the sum of $5,000 is hereby appropriated to pay the necessary costs thereof and expenses in connection therewith. The Secretary of War is further authorized and directed to report the proceedings hereunder to Congress.

2. The question of cutting the narrow isthmus between Cape Cod Bay and Buzzards Bay has been considered at various times since the early history of the Plymouth Colony. A number of surveys have been made and several companies formed for the execution of this project but effective operations were not undertaken until after the charter of the Boston, Cape Cod & New York Canal

Co. on June 1, 1899. The canal constructed by this company has been a working concern since May 31, 1915. The canal is 8 miles long between shore lines and extends 4½ miles into Buzzards Bay and one-half mile into Barnstable or Cape Cod Bay. The plans provide for a depth of 25 feet at mean low water with bottom widths of 100 to 300 feet, the former width (100 feet) covering a stretch of 6 miles. The right of way is from 600 to 1,000 feet in width, extending across the neck. Under authority of its charter the company charges tolls. The present rates are given in the Appendix C, pages 87–92.

3. The Buzzards Bay end of the canal is land locked and requires no artificial protection but the easterly end is exposed and it was found necessary to construct a jetty on the northern side of the entrance for its protection with a length of 3,000 feet. A short jetty or sand catch was also built on the southern side of this entrance. The banks of the canal have been protected by riprap from a depth of 6 feet below mean low water to 6 feet above that plane. The mean tidal range in Buzzards Bay is about 5 feet and in Cape Cod Bay it is nearly 10 feet so that the depth at high water varies from about 30 feet at the western end to about 35 feet at the eastern end. The tides at the two ends of the canal differ not only in range but also in phase, and they are variously affected by winds and storms. The resulting greatest differences of head between the two ends that obtain during every tide have varied according to Mr. Parson's paper in the Proceedings of the American Society of Civil Engineers for August, 1917, between a minimum of 1.3 feet, an average of 5 feet, and a maximum of 9.5 feet. The central surface velocities observed corresponding to heads of 5 feet and 9.5 feet were 3.48 and 4.6 miles per hour, respectively. The discussion given in the report of survey, disregarding the momentum of the flowing water, indicates that for a canal 200 feet bottom width and 35 feet in depth, the velocity corresponding to a head of 5 feet would be 4.13 miles per hour and for a canal of the same width and 40 feet deep would be about 4.39 miles per hour. For a head of 9½ feet, the discussion gives a velocity of 5.41 miles per hour in a 35-foot waterway and 5.76 miles per hour in a 40-foot waterway. It is reasonable to anticipate even greater occasional differences of head with greater velocities.

4. The canal has been in either partial or full operation since 1914, and on January 25, 1918, the State waterways and public lands commission declared it completed in substantial accord with the provisions of the charter authorizing its construction. Work of maintenance is carried on from time to time as required. The canal is used by a large number of vessels engaged in general commerce and in handling coal by tows. During 1916, 4,589 vessels of 3,611,939 gross tonnage passed through the canal and it is estimated that during this period 13,500 commercial vessels of 15,167,998 gross tonnage went around the cape. It should be noted that these figures represent registered tonnage, the cargo tonnage being considerably less, mainly on account of the return trips of empty coal vessels. The New York Herald shipping news indicate that during May, June, and July, 1916, 1,169 vessels of 995,363 gross tonnage passed through the canal and in the same period 3,954 vessels of 4,106,290 gross tonnage went around the cape. The canal company's record of the

best day's traffic, April 24, 1918, shows that 29 vessels of 15,520 gross tonnage and carrying 18,919 tons of cargo used the canal on that day. The total amount of coal received by New England in 1916 amounted to approximately 11,422,000 tons. The above figures indicate that approximately one-fifth of this tonnage passed through the canal. It is claimed by advocates of the canal that with a free canal of dimensions adequate to render navigation reasonably safe, the greater part of this tonnage would make use of the canal and at a possible saving, due to fog and unfavorable weather in passing around the cape, of about 10 cents per ton or a total of approximately $1,142,000 a year. The saving in distance from New York to Boston by the canal route is 70 miles. The superintendent of the floating equipment, Lehigh & Wilkes-Barre Coal Co., indicates that the saving in time for a tow may be as much as 14 hours. One captain reports a loss of 91 days per tug per year in rounding Cape Cod due to fog and other weather conditions. One record submitted for the steamers of the Harper Transportation Co. indicates an average loss of about 11 hours a trip due to these causes. Fog observations during eight years show the following annual averages: Pollock Rip, 127 days fog, 1,066 fog hours; canal between Bird Island and Wings Neck, 64½ days fog, 430 fog hours. Vessels are apparently delayed less by fog in passing through the canal. To these considerations may be added the saving of life and property due to the less dangerous route.

5. Estimates of the cost of enlarging the canal are given by the division engineer as follows:

(*a*) Canal 200 feet bottom width, 35 feet depth at mean low water, approach 300 feet wide.	
Dredging in Buzzards Bay approach	$1,723,526
Dredging in Cape Cod Bay approach	158,550
Excavating main prism of canal	4,662,743
Bank protection in canal	375,000
Total exclusive of breakwater or locks	6,919,819
(*b*) Canal 40 feet deep, other dimensions as above:	
Dredging in Buzzards Bay approach	2,821,813
Dredging in Cape Cod Bay approach	301,000
Excavating main prism of canal	6,185,398
Bank protection in canal	375,000
Total exclusive of breakwater or locks	9,684,211

In a supplemental report of May 16, 1918, submitted at the request of the board, the division engineer gives an estimate of $2,603,256 for increasing the width of the present canal to 200 feet, including deepening in the canal where the project depth does not exist, and deepening and widening of the Buzzards Bay approach where 25 feet depth and 300 feet width have not been secured. It is not deemed practicable to secure a depth of 40 feet without the reconstruction of all the bridges, and some protection for the bridge piers, estimated to cost not to exceed $100,000, will be required for a depth of 35 feet. The installation of a suitable lighting system for the enlarged canal, as estimated by the Bureau of Lighthouses, will cost $40,000 and its maintenance $3,000 annually. The cost of a guard lock is roughly estimated in the report of survey at about $5,000,000 and of a detached breakwater in Cape Cod Bay at about $7,000,000 to

$10,000,000, depending upon its length and the depth of water in which it is located.

6. In compliance with the provision of the law "that the Secretary of War shall call upon the Secretary of the Navy and the Secretary of Commerce for such data and evidence as these Secretaries may wish to have incorporated in the report of survey," the Secretary of the Navy and the Secretary of Commerce were requested by the Secretary of War in his letters of August 23, 1917, to submit such statements, and they submitted lists of questions to be covered in the report. These questions and answers are given in appendixes B and C.

7. As a result of his study of this subject the division engineer concludes that from a military as well as commercial point of view the value of the canal is very large and it would be well worth to the United States the actual cost of construction, provided this were not too great. In his opinion the price to be paid, if it is decided to purchase the canal, should not exceed $8,265,743.04.

8. During its consideration and study of this subject the board gave a hearing to representatives of the canal company and secured certain additional data and information from the division engineer, from the Commission on Waterways and Public Lands of the State of Massachusetts, and from the principal transportation companies interested in the canal as a transportation route.

9. The most general criticism of the canal relates to its narrowness, and a depth of 35 feet with a bottom width of 200 feet appears to be desired by many. It is claimed by the canal company that the present canal dimensions will accommodate all vessels of moderate size and that a canal 200 feet bottom width and 35 feet deep at mean low water will serve the needs of all ships now built as well as those contemplated for the future. The Board's study of the problem leads it to the conclusion that an increase in the width to 200 feet, while a desirable improvement, is hardly justified at the present time by the resulting benefits to commerce, unless the depth is also increased. With reference to the depth, however, it believes that the present depth of 25 feet, if fully maintained, will meet all reasonable requirements of the commercial vessels that may be expected to use the canal in the near future. Very few coastwise vessels have a draft greater than 25 feet and it is understood that those being constructed are generally of less draft. Most of the deeper draft coastwise commercial vessels, moreover, do not apparently make much use of the canal, and some of them state that they would not use it in any case. Its greatest benefits will be derived by smaller vessels and barges for which the outside route is especially dangerous.

10. The tidal currents are of sufficient strength to affect quite decidedly the progress of all vessels, and especially occasion considerable delay to tows when obliged to await favorable conditions. Steamers under their own power may be inconvenienced more or less but apparently are not seriously delayed. For more complete data of the effect of these currents as reported by navigation interests, reference is made to the accompanying report of Col. Francis R. Shunk, Corps of Engineers, dated May 13, 1918 (see p. 75). To offset or control the currents, the construction of a lock or locks has been suggested.

11. The cost of a guard lock is roughly estimated in the report of survey at about $5,000,000 and no detailed estimate of cost can be given in the absence of a decision as to the precise requirements to be met. The division engineer is of opinion that rather than to build a lock in the canal it would be better to suspend navigation in times of greatest velocities. With reference to the necessity or advisability of a guard lock, the evidence of ship masters and others indicates that, while the currents do interfere with the passage of vessels and particularly barges under tow, the great preponderance of opinion is that while currents are obstructive to navigation, a guard lock would be still more objectionable, and that it would be better to put up with the swift currents than to have the annoyance and delay that would be occasioned by the lock, as well as the greater liability of the canal to freeze up in winter. The board is of the opinion that the question of a guard lock can therefore be dismissed from consideration at this time. If one should be found to be necessary hereafter, it could be constructed then as well as now.

12. A detached breakwater in Cape Cod Bay to provide additional protection and a harbor for use in connection with an enlarged canal is estimated to cost approximately $6,000,000 to $10,000,000. The least length of breakwater tentatively suggested is 1 mile, and the estimates range from $6,025,900, for a structure of this length to $10,231,687.50 for one 9,000 feet in length. With a length of 6,000 feet, the protected area is given as 1.52 square miles, while with a length of 10,000 feet, the protected area is given as about 2.58 square miles. The board is of the opinion that a detached breakwater is not necessary or advisable. In times of adverse weather, vessels unable to make the entrance safely can find shelter in Plymouth Harbor, and while this may occasion some delay, the present traffic does not appear to justify the large expenditure required to secure the advantages to be afforded by a breakwater.

13. In appraising the value of the canal consideration has been given both to its cost of construction and to its value for commercial, military, and naval uses. The excavation required for the present canal is stated to have been about 16,000,000 cubic yards. The construction involved much auxiliary work as rebuilding railroad lines, bridges, highways, etc. The issue of stock and bonds as authorized by the Joint Board of Railroad Commissioners and Harbor and Land Commissioners of the State of Massachusetts amounted to $12,000,000.

14. It appears from the report of the certified accountants, Price, Waterhouse & Co. (Appendix A), that the direct cost of construction amounted to $6,243,171.01; the indirect cost, covering Government and State inspection, engineering, administration, organization and promotion, fiscal, legal, and miscellaneous expenses, amounted to $1,274,459.63; and the interest and taxes during construction amounted to $748,112.40, thus giving a total cost of construction amounting to $8,265,743.04, not including amounts paid in capital stock for rights and franchises or for services in promotion, organization, engineering, financing, etc., nor discount on securities, loss or deficit on operations, and damage claims, amounting in all to $4,787,410.67. The total expenditures on the canal (Exhibits E and EE) are thus reported to be $13,053,153.71 up to August 31, 1917, counting the payments with stock and bonds at par. The

board has studied the various items making up these amounts and has reached the conclusion that the sum of $8,265,743.04 may properly be included in toto in determining a fair and reasonable estimate of the cost of the canal. What part, if any, of the indirect expenditures represented by the $4,787,410.67 should be included, is a matter not readily determined. The board has carefully considered the various items comprising this sum and has reached the conclusion that a reasonable allowance for the Flanagan rights of way and franchises and for the development expenses as represented by the losses amounting to $1,527,198.42, experienced prior to August, 1917, in building up a traffic, warrants appraising the fair cost of the canal in round numbers at $10,000,000, as based upon the reported expenditures. This sum is intended to cover all property rights and franchises of whatever description acquired by the company in connection with this enterprise, whether directly used for canal purposes or otherwise. The board has received no definite proposition from the owners of the canal as to the price at which they will sell the property. A representative of the canal company was asked this question at the hearing and he referred the board to a copy of a letter addressed to the Hon. Josephus Daniels, Secretary of the Navy, under date of November 28, 1916 (unsigned copy herewith)[1], in which the price stated is $13,000,000.

15. The law also requires appraisal of the canal franchises, and after due consideration of this feature the board has reached the conclusion that the history and prospects of the enterprise do not warrant allowing them any value. Until it can be established that the enterprise will earn an income on its investment that is at least equal to the ordinary interest rates, the franchises, while essential to the legal existence of the company, can not be assigned any earning value.

16. While the board has concluded that $10,000,000 would be a fair price for the canal, based upon the reported expenditures, it is not convinced that an investment of this amount is justified on the part of the United States in order to make this a free waterway. The information submitted indicates that the claimed advantages of this route over the outside one around Cape Cod have diverted from the latter only about one-fifth of its tonnage. There is involved in this coastwise traffic an undoubted tonnage of great magnitude and the navigators handling this traffic have not considered the merits of the canal sufficient to use it enough to pay its operating expenses up to this time. The tolls are apparently moderate, so that traffic through the canal can hardly be seriously restricted by these charges.

It is true that the company takes the position that the showing of traffic already made is quite satisfactory for a route that has been in operation such a short time, that it anticipates a large increase in the traffic, and that it still regards the property a good investment at its claimed cost of about $13,000,000, so that it is not anxious to dispose of the property even for that sum. At 4 per cent the interest on $10,000,000 would amount to $400,000 a year, and allowing $200,000 a year for the cost of maintenance and operation, the total annual charges on this basis would amount to $600,000. The saving to be effected by the canal is estimated by various parties interested at from 5 to 10 cents a ton. Assuming a saving of 8 cents a ton, a commerce of 7,500,000 tons a year would be required in order to

[1] Not printed.

make a saving equal to this estimated annual cost to the public of acquiring and operating the present canal, without enlargement or further protection. This is more than one-half the total annual cargo movement between New England and points South, as estimated by Col. Shunk in paragraph 4 of his report of May 13, 1918, (see p. 77). Assuming that the saving should be at least double the cost to the public in order to warrant the charge upon public funds, the admissible public charge for this tonnage, which is far in excess of the traffic to be expected in the near future, should not exceed $300,000. Subtracting $200,000 for annual cost of maintenance leaves $100,000 for interest charges which, at 4 per cent, corresponds to a capital investment of $2,500,000. This amount therefore is apparently an upper limit of any justifiable expenditure by the United States to acquire public ownership for commercial purposes.

17. The value of the canal for military and naval purposes remains to be considered. The canal would doubtless have some military value as a transportation route for moving supplies. Its value as affecting strictly military land operations is deemed of comparatively slight importance. Under certain rather improbable contingencies the canal would have some value as a military obstacle, but this would not add very materially to its value as determined above for commercial purposes. Its principal military importance would result from its value for naval operations. The best information available to the board respecting the naval value of the canal is contained in a memorandum accompanying a letter of August 19, 1916, from the General Board of the Navy, upon additional channel improvements required for the operation of the fleet of defense, from which the following is extracted:

> Any waterway to be of maximum possible use to capital ships should have a depth of 40 feet at mean low water; similarly waterways to be of service for the passage of submarines should have a depth of 16 feet at mean low water and the General Board believes that the same depth is advisable for destroyers, although they draw somewhat less than submarines. Waterways of less than 16 feet would be of inconsiderable value to the Navy for the movement of torpedo craft; waterways with a controlling depth between 16 and 35 feet at mean low water have little prospective value for strictly naval vessels although they will be of possible value in the movement of supplies. In other words, for naval vessels 16 feet depth is the least that will be useful for the movement of torpedo craft of present design, and 35 feet for the movement of all classes of vessels, including modern battleships. The development of designs might make these depths too small. The effects of probable ocean swell must be compensated for by additional depth of water at entrances. As a rule the mean water cross sections of 16 and 35 foot channels should be at least five times the immersed cross section of vessels using them and turns should be arcs of circles of radii which the General Board estimates should be at least 2,000 and 3,000 feet, respectively, to insure safe navigation.
>
> * * * * * * *
>
> The military use of the Cape Cod Canal by the Navy consists of taking advantage in time of war of this shorter route and, when an equal or superior hostile force is present in a strategic sense, of a safer route for (*a*) the strategic concentration of our naval forces either to the northward or southward of Cape Cod; (*b*) rendering more available the naval facilities and resources of the New England coast.
>
> The expense of rendering the Cape Cod Canal available to all types of naval vessels not only requires a considerable expenditure for enlarging it, but also additional continuing expense for the maintenance of such increased size, and an even greater expenditure for the defenses that should be given an important military waterway at a salient of our coast. Such large additional expenditures are not warranted by the apparent increased military advantages of having the canal available for the passage of ships requiring a depth of over 25 feet at mean low water.
>
> The board has no doubt of the advantage of a sufficient depth and width to permit the passage of battleships. It adheres, however, to its previous expressions to the

effect that military necessity is not sufficiently great to warrant the department in urging the expenditure of public funds to that end.

The Board of Engineers for Rivers and Harbors has no data upon which it can assign a definite value to the canal for these naval uses. As the canal is a going concern and now available for military and naval uses upon payment of reasonable tolls, there is no urgency for acquisition of the canal for these purposes, unless it is deemed essential to enlarge it to accommodate capital ships of the Navy, which is apparently not the case. The value of public ownership for any uses that can be made of the present canal would obviously be due to the saving of tolls on Government vessels. The capitalized value of these tolls could hardly exceed $1,000,000, thus giving a total value of public ownership for all purposes of not exceeding $3,500,000.

18. The present owners of the canal express themselves as quite satisfied with the present situation and prospects of their investment, and the public can well assent to their retaining the property. The work is apparently affording reasonable accommodations for existing commercial, military, and naval needs, without imposing undue charges for services rendered. In view of these conditions the board concludes that it is not advisable for the United States to acquire the works and franchises of the Cape Cod Canal at this time.

For the Board:

PETER C. HAINS,
Major General, United States Army, Retired,
Senior Member of the Board.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
July 24, 1918.

The CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. Immediately after the board submitted its report on this subject under date of May 29, 1918, the canal company was informed of its tenor and at once requested another hearing before the board in order to submit additional important information. The papers were accordingly returned to the board informally with instructions from the Chief of Engineers to give the desired hearing. This hearing was finally held on July 23 and 24, the canal company not being ready to appear at the previous meetings of the board on June 11 and 25.

2. At the previous hearing given the canal company on April 23, 1918, the data presented related mainly to the question of the cost of construction and value of the canal property. The information then available indicated that while a number of navigation interests, particularly those operating the larger barges, colliers, and other coastwise steamers, preferred to use the outside route and would continue to do so unless large additional expense were incurred in increasing the dimensions of the canal, there were considerable navigation interests, aggregating a total annual gross tonnage of about 3,600,000,

that were being accommodated by the canal. These included especially the smaller craft which would be most exposed to ordinary risks of navigation in following the outside route. It did not appear at that time that the company would be unable to maintain the project dimensions of the canal. This view of the situation has been materially modified by the testimony submitted at the second hearing. This testimony is very generally to the effect that the canal is not efficiently maintained to project dimensions; that these dimensions are quite inadequate for the demands of commerce; that the canal is a financial failure as a private enterprise; and that it should be acquired by the United States and suitably enlarged and maintained to serve the important commercial interests involved in this coastwise movement between points north and south of Cape Cod. These contentions are largely admitted by the representatives of the canal company, though it is maintained that much of the failure to use the canal is due to prejudice on the part of mariners, and the canal even in its present condition is claimed by the company to be capable of handling a much larger traffic than it actually does.

3. The general consensus of the views expressed about the suitable dimensions for commercial purposes is to the effect that the canal should have a depth of 30 feet and a bottom width of 200 feet. In view of the general sentiment in favor of these dimensions, it is recommended that an estimate for such an enlargement be obtained. The data available indicate that this will probably be about $5,000,000.

4. In making its former recommendation against the purchase of the canal the board was influenced by the consideration that the estimated value for public ownership was so far below the cost of construction and the value at which the company apparently held its property that an offer to purchase at the appraised value for public ownership would be only futile. In view of the situation as now presented, in which all parties, including the canal company, concur in recommending public ownership as the only means of providing and maintaining an efficient waterway, aside from any question of the price to be paid for the property, the board modifies its former conclusion to the extent of recommending the acquisition of the canal, including all property, franchises, and appurtenances used or acquired for use in connection therewith or appertaining thereto, provided this can be accomplished at a price which is reasonable in view of the public benefits to results from public ownership. In the board's opinion this value does not exceed $3,500,000, as previously recommended, especially in view of the large additional expenditures that must be made to provide adequate facilities.

5. If the canal is acquired by the United States, the board recommends that steps be taken at once to widen the canal to 200 feet and to deepen the canal and its approaches to 30 feet.

For the board:

PETER C. HAINS,
Major General, United States Army, Retired,
Senior Member of the Board.

PRELIMINARY EXAMINATION OF CAPE COD CANAL, MASS.

WAR DEPARTMENT,
OFFICE OF DIVISION ENGINEER, NORTHEAST DIVISION,
New York, N. Y., January 25, 1918.

From: The Division Engineer.
To: The Chief of Engineers, United States Army.
Subject: Preliminary examination of the Cape Cod Canal, Mass.

1. This report on a preliminary examination of the waterway connecting Buzzards Bay and Cape Cod Bay, Mass., is submitted in compliance with departmental instructions contained in letter from the Chief of Engineers, dated September 5, 1917, and pursuant to the provisions of the river and harbor act approved August 8, 1917, of which the following is an extract:

Waterway connecting Buzzards Bay and Cape Cod Bay, Massachusetts: The Secretary of War, the Secretary of the Navy, and the Secretary of Commerce are hereby authorized to examine and appraise the value of the works and franchises of the Cape Cod Canal, Massachusetts, connecting Buzzards and Cape Cod Bays, with reference to the advisability of the purchase of said canal by the United States and the construction over the route of the said canal of a free waterway, with or without a guard lock, and having a depth and capacity sufficient to accommodate the navigation interests that are affected thereby. This investigation shall be conducted under the direction of the Secretary of War and the supervision of the Chief of Engineers in the usual manner provided by law for making preliminary examinations and surveys, except that the Secretary of War shall call upon the Secretary of the Navy and the Secretary of Commerce for such data and evidence as these Secretaries may wish to have incorporated in the report of survey, and, further, that the final report of the investigation with its conclusions upon probable cost and commercial advantages, and military and naval uses of the said canal, shall be submitted to the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce for their action before it is transmitted to Congress.

If the said Secretaries are all in favor of the acquisition of the said canal, the Secretary of War is hereby further authorized to enter into negotiations for its purchase, including all property, franchises, and appurtenances used or acquired for use in connection therewith or apertaining thereto; and he is further authorized if, in the judgment of the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce, that the price for such canal is reasonable and satisfactory, to make contracts for the purchase of the same, at the option of the United States, subject to future ratification and appropriation by the Congress; or, in the event of the inability of the Secretary of War to make a satisfactory contract for the voluntary purchase of said Cape Cod Canal and its appurtenances, he is hereby authorized and directed, through the Attorney General, to institute and carry to completion proceedings for the condemnation of said canal and its appurtenances, the acceptance of the award in said proceedings to be subject to the future ratification and appropriation by Congress. Such condemnation proceedings shall be instituted and conducted in, and jurisdiction of said proceedings is hereby given to, the district court of the United States for the district of Massachusetts, substantially as provided in "An act to authorize condemnation of land for sites for public buildings and for other purposes," approved August first, eighteen hundred and eighty-eight; and the sum of $5,000 is hereby appropriated to pay the necessary costs thereof and expenses in connection therewith. The Secretary of War is further authorized and directed to report the proceedings hereunder to Congress.

2. Referring to first indorsement from the Chief of Engineers to the division engineer, northeast division, dated September 15, 1917, in which is stated, "In view of the special character of this investigation, it is considered advisable to modify the general instructions covering the character of reports of preliminary examination, so as to provide in this instance simply for such a presentation of the matter as will suffice to determine in a general way the scope

of the work to be included in the survey," I beg to submit the following:

3. In accordance with that portion of the river and harbor act approved August 8, 1917, relating to "Waterway connecting Buzzards Bay and Cape Cod Bay, Massachusetts, * * *" a firm of certified public accountants has been employed to examine, with a view to appraising, the value of the works and franchises of the Cape Cod Canal, having in mind the purchase of said canal by the United States, the books, accounts, etc., of the Boston, Cape Cod & New York Canal Co., and the Cape Cod Construction Co. Their report has been rendered, showing plainly the cost of construction of the canal, interest during construction, amounts paid in capital stock and bonds for rights, franchises, etc., organization, promotion, engineering and financing, discount on bonds, and deficit on operations, etc. This report will be appended and marked "A" to the report on the survey of the Cape Cod Canal, which is now in process of completion, and will be submitted the latter part of February. Due to the extreme cold weather and the canal being frozen, the survey has been somewhat delayed.

4. The letter from the Secretary of the Navy to the Secretary of War, in which he desires certain information to be incorporated in the report of the survey, and which was transmitted to this office by the Chief of Engineers under date of September 28, 1917, the information requested therein has been obtained by this office from various sources, in so far as such information is available, and will be marked "B" and appended to the report of survey; also the letter from the Secretary of Commerce to the Secretary of War, which was transmitted to this office by the Chief of Engineers under date of November 19, 1917, in which he desires certain information to be incorporated in the report of survey. The information requested therein has been obtained, as far as practicable, from various sources and will be marked "C" and appended to report of survey.

5. The scope of the work to be included in the survey will be to determine the advisability of purchase of said canal by the United States and the construction over the route of the said canal of a free waterway, with or without a guard lock, and having a depth and capacity sufficient to accommodate the navigation interests that are affected thereby. The survey will determine the velocities of currents, present depths of water in the canal, and difficulties encountered in keeping the canal open. Survey would also secure the necessary data to estimate the cost of dredging and bulkhead work necessary to deepen and widen the canal to 35 feet at mean low water, with bottom width of at least 200 feet; the extension of this canal prism beyond the present terminals in both Cape Cod Bay and Buzzards Bay; the initial estimated cost of the canal so constructed and the cost of maintenance; the estimated time required to complete the waterway for operation; also same data and estimate if the canal has a bottom width of 200 feet and depth of 40 feet at mean low water; the extent of breakwater construction to maintain the waterway in and beyond present canal terminals; and the estimated first cost and cost of maintenance in each case. The matter of locks might be estimated from data obtained from the approximate survey.

The survey will also show whether the minimum depths of water in the canal are found at definite and separate localities, while in

other portions of the canal the charter depth of 25 feet at mean low water exists, and will indicate whether shoaling, if any, occurs throughout or only at separate spots and to what extent, and why. The survey will also contain a statement regarding wind data for a given number of years, in order to determine the possible need of a harbor of refuge near the north end of the Cape Cod Canal; the relative amount of fogs at canal terminals and on the canal as compared with the amount of fog on the shoals or outside of Cape Cod; the tidal currents in the canal, and in and near Polluck Rip and on the eastern coast of Cape Cod; whether or not the bridges spanning the canal are suited to a possible future depth of 35 feet of water in the canal. The present canal where 100 feet wide on the bottom is located so that the 100 feet is on one side of the center line of the right of way with a view to widening 100 feet on the other side of center line; the present cost of constructing the canal as it stands as compared with the actual price paid for its construction, etc.

6. Referring to circular letter from the Office of the Chief of Engineers, dated December 3, 1917, on the subject of "Time for making surveys recommended in reports of preliminary examinations," it is believed that the work proposed is of sufficient importance to make it desirable to proceed with the survey at once, and it is recommended that the survey, already started, be carried to completion.

WM. T. ROSSELL,
Brigadier General, United States Army, Retired.

[Second indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
February 12, 1918.

The CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The scope of the survey as outlined herein appears to be sufficiently broad to secure the information desired by Congress and necessary to determine the question of the advisability of the purchase of the Cape Cod Canal by the United States, and is recommended for approval. The board also concurs with the division engineer in the opinion that the work proposed is of sufficient importance to make it desirable to proceed with the survey at once and not await the conclusion of the war with Germany.

For the board:

PETER C. HAINS,
Major General, United States Army, Retired,
Senior Member of the Board.

SURVEY OF CAPE COD CANAL, MASS.

WAR DEPARTMENT,
OFFICE OF DIVISION ENGINEER, NORTHEAST DIVISION,
New York, N. Y., April 4, 1918.

From: The Division Engineer.
To: The Chief of Engineers, United States Army.
Subject: Report on Survey of the Cape Cod Canal, Mass.

1. This report on a survey of the waterway connecting Buzzards Bay and Cape Cod Bay, Mass., is submitted in compliance with departmental instructions contained in letter from the Chief of

Engineers, dated February 23, 1918, and pursuant to the provisions of the river and harbor act approved August 8, 1917, of which the following is an extract:

Waterway connecting Buzzards Bay and Cape Cod Bay, Massachusetts: The Secretary of War, the Secretary of the Navy, and the Secretary of Commerce are hereby authorized to examine and appraise the value of the works and franchises of the Cape Cod Canal, Massachusetts, connecting Buzzards and Cape Cod Bays, with reference to the advisibility of the purchase of said canal by the United States and the construction over the route of the said canal of a free waterway, with or without a guard lock, and having a depth and capacity sufficient to accommodate the navigation interests that are affected thereby. This investigation shall be conducted under the direction of the Secretary of War and the supervision of the Chief of Engineers in the usual manner provided by law for making preliminary examinations and surveys except that the Secretary of War shall call upon the Secretary of the Navy and the Secretary of Commerce for such data and evidence as those Secretaries may wish to have incorporated in the report of survey, and further, that the final report of the investigation with its conclusions upon probable cost and commercial advantages, and military and naval uses of the said canal, shall be submitted to the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce for their action before it is transmitted to Congress.

If the said Secretaries are all in favor of the acquisition of the said canal, the Secretary of War is hereby further authorized to enter into negotiations for its purchase, including all property, franchises, and appurtenances used or acquired for use in connection therewith or appertaining thereto; and he is further authorized, if in the judgment of the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce, that the price for such canal is reasonable and satisfactory, to make contracts for the purchase of the same, at the option of the United States, subject to future ratification and appropriation by the Congress; or, in the event of the inability of the Secretary of War to make a satisfactory contract for the voluntray purchase of said Cape Cod Canal and its appurtenances, he is hereby authorized and directed through the Attorney General, to institute and carry to completion proceedings for the condemnation of said canal and its appurtenances, the acceptance of the award in said proceedings to be subject to the future ratification and appropriation by Congress. Such condemnation proceedings shall be instituted and conducted in, and jurisdiction of said proceedings is hereby given to, the district court of the United States for the district of Massachusetts, substantially as provided in "An act to authorize condemnation of land for sites for public buildings and for other purposes," approved August first, eighteen hundred and eighty-eight; and the sum of $5,000 is hereby appropriated to pay the necessary costs thereof and expenses in connection therewith. The Secretary of War is further authorized and directed to report the proceedings hereunder to Congress.

2. The cutting of the narrow isthmus between Cape Cod Bay and Buzzards Bay was not, however, thought of as a military necessity until 1776, when George Washington ordered his engineer, Thomas Machin, to make a survey of the route which would "give greater security to navigation and against the enemy."

1
1791—John Hills and James Winthrop make survey.
1798—James Sullivan and others petition legislature to build.
1803—Committee appointed by legislature to interest people in project.
1808—Gallatin, Secretary of Treasury, advocated it as "useful in time of war."
1812—Isthmus used by small boats to avoid capture by enemy.
818—Israel Thorndike and Thomas H. Perkins employed Loammi Baldwin to survey route; 5,000 ships rounding cape; United States Senate made survey for a canal sufficient to admit vessels of war.
1824—United States under resolution of Senator Lloyd ordered Maj. Perault to make survey; various Army officers reported route practicable.
1825—Further surveys made under Government orders until 1827.
1828—Government board reports on canal 36 feet wide, 8 feet deep, to cost $669,522.
1844—Lieut. G. S. Blake, U. S. N.; survey.
1860—Renewed interest by Massachusetts and Government. Surveys by Brig. Gen. J. G. Totten; Prof. A. D. Bache, Superintendent Coast and Geodetic Survey; Comdr. C. H. Davis, U. S. N.; and Lieut. J. Wilkinson, U. S. N. Report on 18-foot canal to cost $10,000,000.

1870—Charter to Cape Cod Ship Canal Company to Alpheus A. Hardy and others; Maj. Gen. J. G. Foster, U. S. A., examining route under orders; reports on practicability of 23-foot canal without locks.
1880—Charter granted to Cape Cod Canal Company; Henry M. Whitney and others interested; some work done, but project abandoned.
1882—Gen. G. K. Warren, U. S. A., Engineers, reports to Government on canal and cost of approaches.

Subsequent to the latter date various companies were formed, resulting, on June 1, 1899, with the charter to the Boston, Cape Cod & New York Canal Co., under which, and its amendments, the present corporation has since acted.

3. The above chronological table is quoted fully as it is here to show the general interest that was felt in the canal to cross the Isthmus, extending over the entire period of the existence of the United States, and while several surveys were made, this canal was not successfully built until the present existing structure was finished. The question at issue through these times seems to have been a question of whether or not a lock was necessary, and Gen. Foster's report seems to have been the first such report made that advocated the building of the canal without a lock. The present canal has now been in existence as a working concern since May 31, 1915. In this report the use of the canal is being considered as two years, extending from May 31, 1915, to August 31, 1917. The dimensions of the canal as dug were 100 feet wide on the bottom for a continuous stretch of 6 miles only, the bottom width in the other portions of the canal ranging from 150 to 300 feet in width, as follows:

100 feet in width 31,000 feet in length.
150 feet in width 1,500 feet in length.
200 feet in width 4,000 feet in length.
250 feet in width 29,000 feet in length.
300 feet in width 5,500 feet in length.

Side slopes of the canal were to be not less than 1 vertical to 2 horizontal. The canal is 13 miles long and extends 4½ miles into Buzzards Bay and one-half mile into Barnstable Bay. The amount of excavation that was needed to cut this canal prism through was 16,000,000 cubic yards.

4. The Boston, Cape Cod & New York Canal Co., which owns the canal, was incorporated by special act of the Legislature of Massachusetts, known as "Chapter 448 of the Laws of 1899," which, with the amendment of July 17, 1900, makes the charter of the company, a copy of which is herewith inclosed.[1] This charter is perpetual, except only as the right is reserved by the State, after 20 years from date of opening the canal, to acquire by purchase all of the property of the canal by paying therefor such sum as will reimburse to it the amount of capital paid in with a net profit thereon of 10 per cent a year from the time of the payment thereof by the stockholders to the time of purchase. The cost of the work was fixed by the Railroad Commission of Massachusetts, after submission to public letting, at $12,000,000.

The charter gives the company the right to charge tolls, to collect the same, to build and operate wharves, and do other business in connection with the operation of the canal. It provides that the canal shall have a minimum depth at mean low water of 25 feet, and a minimum width on the bottom of 100 feet, with side slopes to be not less than 1 vertical to 2 horizontal.

[1] Not printed.

5. The canal commences at the head of Buzzards Bay, follows the valley of the Monument River, crosses the divide between Buzzards Bay and Cape Cod Bay, and enters the latter at point just north of the village of Sandwich. The distance between the shore lines of the two bays is about 8 miles, but inasmuch as the headwaters of Buzzards Bay are comparatively shallow, it was necessary, in order to get a depth of 25 feet at low water, to extend excavation for a distance of 4½ miles in Buzzards Bay to a point off Wings Neck Light, and to dredge a channel in Cape Cod Bay about one-half mile in length. The total length of excavated channel, therefore, from deep water in one bay to deep water in the other bay, is 13½ miles. Although the charter provided for a minimum width of 100 feet, the canal company has constructed a very much larger canal, the minimum width being for a continuous stretch of 6 miles only.

6. In Buzzards Bay the mean rise and fall of the tide is about 5 feet, and in Cape Cod Bay it is nearly 10 feet, so that with a minimum depth of 25 feet at low water, there is a depth at high water varying from 30 to 35 feet.

7. A right of way for the land portion of the canal, 600 feet in width for 6 miles, and 1,000 feet in width of 1¾ miles, has been acquired, of which 95 per cent has been acquired in fee simple, the balance by condemnation.

8. The westerly or Buzzards Bay end of the canal is land locked and required no special treatment. The easterly end, however, lies on the open shore of Cape Cod Bay, in order to protect which it was necessary to build two breakwaters, the longer of which has a length of 3,000 feet and extends from the shore outwardly to where the water is 35 feet deep at mean low water. Four hundred thousand tons of granite have been placed in these breakwaters. The banks of the canal have been protected by riprap of granite stone, extending from a depth of 6 feet below mean low water to 6 feet above mean high water. In order that the canal could be widened with the minimum amount of disturbance to existing work, the canal was constructed, not in the center of the right of way, but to one side of such center line, so that if the canal should be widened to a bottom width of 200 feet, the center line of such canal would be coincident with the center line of the right of way, so that the riprapping on one side of the canal only would be disturbed.

9. The construction of the canal involved the doing of much auxiliary work, in addition to the acquisition of the right of way and the building of the breakwaters above described. This additional work consisted of the relocation and rebuilding of the lines of the New York, New Haven & Hartford Railroad Co., which, following the valley, occupied in considerable part the location of the canal; the building of 4½ miles of highways on both sides of the canal, and the construction of three bridges across the canal—one for railroad purposes at Buzzards Bay and two for highways and trolley purposes, one at Bourne and the other at Sagamore. These bridges are of the Bascule type, with a span of 160 feet in each case, giving a clear opening between the fenders of 141 feet. The foundations constructed, in one case in open caissons on piles, and in the other two cases by closed caissons under compressed air, have been carried to such a depth that a canal of 35 feet or more in depth can be

constructed without interfering with the bridges. The bridges are operated electrically, the sources of power being three, so as to provide against failure, in addition to which they can be opened by hand. For purposes of navigation, the canal is lighted by electric lights in pairs, at intervals of 500 feet, except in the approach channels where the Government has established its own system of larger lights and at longer intervals.

10. A canal of the dimensions described above is sufficiently large to accommodate all the smaller vessels of the Navy; in fact, all vessels except battleships and large cruisers, and since the canal has been in operation, it has been used by the small vessels of the Navy in increasing numbers.

11. The proposed enlargement of this canal prism is to make it deep enough and wide enough to accommodate all vessels and the larger class of freight boats. The work to make the canal suitable for this use will have to be done in addition to the price paid for the canal. To make the canal large enough to accommodate vessels of the greatest size, it will be necessary to give an increased depth, and probably an increased width, but taking in view improvements that are being made in other parts of the country, I have assumed, for purposes of estimate, that a depth of 35 feet at mean low water and a minimun width on the bottom of 200 feet would be sufficient to accommodate the ships, not only those now built but such as it is understood are in contemplation for the future. The original construction of the canal contemplated the possibilities of just such enlargement. The railways, highways, and bridges have all been built to admit the canal to be thus widened, without necessitating their reconstruction or other adjustment, and the right of way is of sufficient width to permit this widening without the acquisition of more land; and the canal itself being built to one side of the center line of the right of way, will involve the loss of but one-half of the riprap protection.

12. The chief element affecting the current velocity is the slope of the water surface. From United States Coast Survey bench marks at Back River (Buzzards Bay end of canal) and Sagamore Beach, Cape Cod Bay, supplemented by a careful line of levels run by the party from this office, the mean low water of Buzzards Bay is found to be 4.84 feet above the mean low water of Cape Cod Bay. (The actual head on August 26, 1916, when observations were made from which deductions were made by Mr. Parsons of the canal company was 5.96 feet.)

With a head of 4.84 feet, the mean slope (straight line from one end to the other) is 0.00012. Applying Kutter's formula, $v = c\sqrt{rs}$, with a section 200 feet bottom width, 40 feet depth, with side slopes of 1 on 2, and a section of same bottom width and slope with 35 feet depth, the following results are found:

	40-foot depth.	35-foot depth.
Wetted perimeter=p =	378.88	356.4
Area of section =a =	11,200	9,450
Hydraulic radius =r=$\frac{a}{p}$=	29.56	26.51
Slope =s	.00012	.00012
$\sqrt{rs}$ =	.0595	.0563

$v = c\sqrt{rs}$

The coefficient "c," dependent upon the roughness, size, shape, and slope of the canal, is taken from tables derived from the experimental investigations, and is found to be as follows, for assumed values of "n," the coefficient of roughness:

	Feet per second.	Miles per hour.
For 40 feet deep section—C:		
When n=0.02 =128 then v=	7.61	5.11
When n=0.025=108 then v=	6.42	4.37
When n=0.03 = 95 then v=	5.65	3.85
For 35 feet deep section—C:		
When n=0.02 =126 then v=	7.09	4.83
When n=0.025=106 then v=	5.97	4.07
When n=0.03 = 93 then v=	5.24	3.57

By the same formula applied to a section 100 feet wide on the bottom 25 feet deep with side slopes of 1 on 2, the theoretical section of the existing canal, it is found that when "n" is taken as 0.02, the velocity resulting is 3.09 miles per hour, and when "n" is taken as 0.03, the velocity is 2.69 miles per hour.

In the section very carefully measured by the canal company, in a straight piece of the canal of uniform cross section and the results and methods both checked by a representative of the United States Coast Survey and by the engineer of the Harbor and Land Commissioners of Massachusetts, the mean velocity of the current was found to be 2.79 knots (a knot stated to be 6,080 feet), which is equivalent to 3.21 miles per hour, while the computed velocity with the slope taken at 0.00012 is 3.09 miles per hour, so that it is highly probable that a value of "n" as 0.025 is a very close approximation to its true value, and with this mean head of 4.84 the mean velocity of the current in a channel 200 feet bottom width and 40 feet deep would be about 4.37 miles per hour, and in a canal of the same width and 35 feet deep would be about 4.07 miles per hour.

But the head under which these velocities are produced is subject to considerable changes by reason of the spring and neap tides and to a greater extent by long-continued storms.

There is below a table giving the theoretical velocities resulting from heads varying from 4.5 to 9.5 feet and for sections of 40 feet and 35 feet depth.

Velocities for different heads and sections.

Both sections.		40 feet deep.		35 feet deep.		Velocities.			
						Section 40 feet deep.		Section 35 feet deep.	
Head in feet.	Slope=s; canal ends 40,000 feet apart.	$\sqrt{rs}$ in which r=29.56.	C.	$\sqrt{rs}$ in which r=26.51.	C.	Feet per second.	Miles per hour.	Fect per second.	Miles per hour.
4.5	0.0001125	0.0577	107	0.0546	105	6.17	4.21	5.73	3.91
5.0	.0001250	.0608	106	.0576	105	6.44	4.39	6.05	4.13
5.5	.0001375	.0637	106	.0604	104	6.75	4.60	6.28	4.28
6.0	.0001500	.0666	105	.0630	104	6.99	4.76	6.55	4.47
6.5	.0001625	.0693	105	.0656	103	7.27	4.95	6.76	4.61
7.0	.0001750	.0719	104	.0681	102	7.48	5.10	6.94	4.73
7.5	.0001875	.0744	103	.0705	102	7.66	5.22	7.19	4.90
8.0	.0002000	.0769	103	.0728	101	7.72	5.40	7.35	5.01
8.5	.0002125	.0793	102	.0750	101	8.09	5.51	7.57	5.16
9.0	.0002250	.0816	102	.0772	100	8.32	5.67	7.72	5.27
9.5	.0002375	.0837	101	.0793	100	8.45	5.76	7.93	5.41

All of the above supposes a uniform slope from end to end of the canal, but this does not exist in the present canal for various reasons, some of which are analyzed from the purely scientific point of view in Mr. Parsons's paper.

The only deduction to be made from the above is that under certain heads and cross sections as indicated the mean velocities will approximate those stated in the table. In computing these velocities, cross sections 200 feet bottom width, side slopes of 1 on 2, and depths of 40 feet and 35 feet have been used, but these depths are not exactly correct, for the maximum head occurs at about high water at one end and half tide at the other, so that really the depth of water at the actual section under consideration is somewhat greater than the proposed low-water depths and depends upon the location of the section in the canal, the range of tide at one end being about 4 feet and at the other end about 9 feet, with ranges at intermediate points varying between them.

It is not believed that small fractions of a mile per hour in the velocity are of very much consequence to the navigator in passing through the canal, but that whether the velocity is 3, 4, or 5, or more miles per hour may be of vital consequence to him. The passage of Woods Hole Strait is made daily by steamboats negotiating a current (with or against) probably much stronger than would be found in the Cape Cod Canal, but the passage is short and straight, while the canal is much longer and curving nearly its entire length between the shores of the two bays.

13. There is appended hereto, and marked "A," report, in duplicate, of Price, Waterhouse & Co., certified public accountants, of the examination of the books, accounts, etc., of the Boston, Cape Cod & New York Canal Co. and the Cape Cod Construction Co., appraising the value of the works and the franchises of the Cape Cod Canal, having in mind the purchase of said canal by the United States and showing plainly the cost of construction of the canal, interest during construction, amounts paid in, capital stock and bonds for rights, franchises, etc., organization, promotion, engineering and financing, discount of bonds, deficit on operations, etc.

From the above report the cost of the canal in money, and also in money plus promoters' expenses, etc., amounted to $12,859,191.46, while the actual cost of construction of the canal itself, without the expenses referred to, amounted to $8,265,743.04.

14. There is appended hereto, and marked "B," answers to questions asked by the Secretary of the Navy in letter to the Secretary of War, dated September 21, 1917, transmitted to this office by the Chief of Engineers, under date of September 28, 1917, which it is desired to have incorporated in the report of survey. The information contained therein has been obtained by this office from various sources in so far as such information was available. There is appended hereto, and marked "C," answers to questions asked by the Secretary of Commerce, dated November 13, 1917, which was transmitted by the Chief of Engineers to this office under date of November 19, 1917, in which it is desired that the information requested therein be incorporated in the report of survey. The information requested therein has been obtained from various sources in so far as the same was available.

15. There is appended hereto, and marked "D,"[1] statement showing the maximum wind velocities, direction, and dates at Nantucket, Mass., for a given number of years, having in view the determination of the possible need for a harbor of refuge near the north end of the Cape Cod Canal, and there is also appended, and marked "E," record showing amount of fogs at canal terminals and on the canal as compared with the amount of fog on the shoals or outside of Cape Cod.

16. The tidal currents (head tide) naturally retard to a degree all vessels, heavy ships of low power, and loaded barges, but no case of material delay due to the current has been experienced. The two accidents to heavy vessels which have occurred in the canal were mainly due, however, to defective steering mechanism or incompetence on the part of the navigators as well as antiquated type of vessel and deficient power. The only craft while passing through the canal which could be affected by transverse winds are light barges which present much freeboard to the wind when empty. The prevailing winds are northeast and southwest, and as the canal runs in the same general direction there is scarcely any transverse wind. Heavy ships would be able to very rapidly pass through the canal if it were widened and, of course, the deeper the canal the greater the draft should be of vessels using the canal. No serious criticism has ever been made of the canal except as to its narrowness. It is believed that widening the canal will overcome all criticism that has been made by navigators. No objection has ever been made on account of the velocity of the current except that it made navigation more difficult on account of the present width of the canal.

17. The following is quoted from letter of the commissioner, Bureau of Lighthouses, Department of Commerce, relative to the proper lighting of the Cape Cod Canal.

> I beg to state that, in the opinion of this office, a system of 48 electric lights (24 on each side of the canal), placed on 15-foot galvanized-steel towers, would answer the requirements of navigation in the canal. The lights should be located about 2,000 feet apart, apparatus to be 40-watt lamps in post lanterns, with 8-inch pressed-glass lens, the lights on the starboard hand to be red, those on the port hand white, entering the canal from the Buzzards Bay end.
>
> In view of the fact that the present pole line along the canal is more of a temporary than of a paramount nature, it would appear to be necessary to install new lines on both sides of the canal for its entire length, and it is estimated that the cost of erecting these pole lines and installing the 48 lights referred to would cost approximately $40,000, while the annual maintenance of the system would be approximately $3,000

ESTIMATE OF COST OF ENLARGING THE CAPE COD CANAL.

18. *The Buzzards Bay approach channel.*—This channel at present, as shown by the map of the United States Coast and Geodetic Survey made during the fall of 1917, and a survey in the vicinity of Mashnee and Hog Islands made by this office during May and June, 1917, shows that the depth of 25 feet at mean low water does not exist for the full width of 300 feet throughout the channel, but that at one place near the northerly end there is a 25-foot depth over only about 50 feet of the width, the soundings at this locality varying from 20 to 24 feet. At one other point below Tobey Island, the 25-foot

[1] Not printed.

depth is 150 feet wide with two considerable spots of less than that depth in the channel. At few points is the 25-foot depth fully 300 feet wide within straight lines drawn to include the most of the deep water in the dredged channel. While there is a navigable channel of 25 feet depth in the approach to the canal, it is somewhat obstructed as stated above.

19. The soundings in the approach channel are referred to the plane of mean low water in Buzzards Bay as determined from bench marks of the United States Coast and Geodetic Survey.

20. It is estimated that the quantity of material to be removed to provide for the enlargement of the Buzzards Bay approach channel to a width of 300 feet and depth of 35 feet, with side slopes of 1 on 3, from the mouth of Monument River to the 35-foot curve in Buzzards Bay, about 1.4 miles southwesterly from Wings Neck Lighthouse, with enlargements at the bends, a total distance of about 6 miles, together with a small amount of dredging near Cleveland Ledge to straighten the approach from Buzzards Bay, is 4,924,360 cubic yards, scow measurement.

21. To make the channel 40 feet deep, which will extend it about 4 miles farther into Buzzards Bay, will require the removal of 8,062,324 cubic yards, scow measurement.

22. An estimate was made of the excavation that would be necessary in case it was deemed advisable to widen the channel to 600 feet in the lower portion after it had entered the bay and was well cleared from the land involving about 1 mile of the lower end of the 35-foot channel and 5 miles of the lower end of the 40-foot channel. It is found that this would add about 944,160 cubic yards to the excavation of the 35-foot channel and about 1,448,435 cubic yards to the above estimates giving as totals for the approach channel below the mouth of Monument River 5,868,520 cubic yards for the 35-foot channel and 9,510,759 cubic yards for the 40-foot channel.

23. The character of the material to be removed is glacial drift composed of sand, clay, gravel, and large and small bowlders offering what is considered very hard digging varying greatly in local characteristics.

24. In view of the character of the material, the more or less restricted area of operation, the necessity of leaving a passageway open to navigation, and the greatly increased cost of labor, fuel, and other materials, the cost of this work is estimated at 35 cents per cubic yard.

25. Estimate, Buzzards Bay approach:

Enlarging approach channel to—	
35 feet depth and 300 feet width, 4,924,360 cubic yards, at 35 cents	$1,723,526
40 feet depth and 300 feet width, 8,062,324 cubic yards, at 35 cents	2,821,813
Same as above except widened to 600 feet near low ends:	
35 feet depth, 5,868,520 cubic yards, at 35 cents	2,053,982
40 feet depth, 9,510,759 cubic yards, at 35 cents	3,328,766

26. The estimate of excavation from the approach channel at the Cape Cod Bay or eastern end of the canal as based on Coast Survey bench marks and available Coast Survey charts indicates as follows for the 35 and 40 foot channels:

Channel 300 feet wide:	Cubic yards.
35 feet deep	453,000
40 feet deep	860,000

Both are for scow measurement. The dumping ground for this material could probably be made with safety along the outside of the detached breakwater if such were built, making a short haul for the dredgings and permitting dumping in about 8 fathoms of water, or the dumping could be made a little farther out in Cape Cod Bay in water exceeding 10 fathoms in depth, which appears to be the most available locality for dumping the greater part of the material excavated from the canal prism.

27. The length to be dredged for a 35-foot approach channel at the eastern end of the canal will be about 3,500 feet and for the 40-foot channel about 6,000 feet. The dredging of these channels will be about the same as in the Buzzards Bay approach with a somewhat deeper covering of softer material, but owing to the much greater exposure to unfavorable weather the cost per yard is estimated at the same figure, viz, 35 cents, as that in the Buzzards Bay approach.

28. Estimate, Cape Cod approach:

Enlarging approach channel to—	
35 feet depth and 300 feet width, 453,000 cubic yards, at 35 cents	$158,550
40 feet depth and 300 feet width, 860,000 cubic yards, at 35 cents	301,000

29. The excavation for the existing canal is made chiefly on the northerly side of the right of way; that is, the center line of the right of way, with a few exceptions for specific reasons, is made to coincide with the foot of the southerly slope of the canal bank, the purpose of which was to provide for the widening of the canal on its southerly side. That is, the northerly half of the right of way has been used in constructing the present canal, leaving the southerly half available for widening. The estimate herewith is based on all of the widening being made on the southerly side of the right of way.

30. The plane of reference to which both soundings and elevations as shown on the map are referred is essentially parallel to a plane connecting the mean low water in Buzzards Bay with that in Cape Cod Bay as determined from the bench marks of the Coast and Geodetic Survey, and this plane is taken for the purposes of computation as being composed of 10 horizontal planes each slightly less than 1 mile in length, with a step of three-tenths of a foot at the end of each subplane, a total fall of 2.7 feet between the elevations of the two low-water planes.

31. The total volume of excavation from the canal prism between Cape Cod Bay and the mouth of Monument River to make a canal 200 feet bottom width and 35 feet depth is estimated at 9,325,486 cubic yards and for a canal 40 feet deep 12,370,795 cubic yards, place measurement. The material is similar to that described for the Buzzards Bay approach channel.

32. The disposal of this large volume of material is a more complex problem. The southern half of the right of way will be practically all included within the lines of the excavation, so that there will be very little, if any, room available for deposit of spoil. There is some marsh land at the easterly end of the canal, but this is on the north side of the canal, and its use as a dumping ground would involve crossing the canal with all the excavation; this in connection with the purchase of the large area of land that would be necessary seems to eliminate that method of disposal as practicable. The remaining method is that of dumping from dump scows. In Cape Cod Bay there is an almost unlimited area of deep water exceeding 10 fathoms

in depth, beginning about 2½ miles off from the mouth of the canal and extending northward, which would afford ample space for dumping with the restriction that none should be above the grade of 10 fathoms below mean low water. In Buzzards Bay, areas would be selected where the deposits should not arise above the grade of 12 or 14 feet below mean low water and which would be so situated away from the main passages used in the bay as not unduly to interfere with the usual light-draft vessels using them.

33. From the southerly edge of the existing 100 feet wide channel the new excavation would cover a width of 150 feet or more until the bottom of the final southerly slope was nearly reached. This would afford room for three dredges to work, being placed on separate parallel cuts with a considerable longitudinal distance between them and not extend at all into the existing channel. Should intermediate points of excavation by means of steam shovels, by hydraulic methods, or otherwise be in operation, it would necessitate the erection of storage bins with chutes into scows at either end of the canal for transference to the dumping grounds.

34. The material is practically the same as already described and the restrictions of operation somewhat increased with probably additional cost in the removal of boulders and the rehandling of material from intermediate points of attack into scows for dumping. It is estimated that the cost of this excavation will be 50 cents per cubic yard.

35. Estimate, main prism of canal:

Enlarging canal to 35 feet depth and 200 feet width, 9,325,486 cubic yards, at 50 cents	$4,662,743.00
Enlarging canal to 40 feet depth and 200 feet width, 12,370,795 cubic yards, at 50 cents	6,185,397.50

36. The protection from wash of the sides of the canal will require about 125,000 tons of small stone, which it is estimated will cost $3 per ton. This will provide a covering of about 2 feet in thickness over an area extending from 6 feet below low water to 6 feet above high water. This stone could probably be advatageously brought from the Connecticut quarries, and perhaps some furnished from broken boulders from the excavation.

37. Estimate of bank protection:

125,000 tons of stone, at $3	$375,000

38. Consolidated estimate of work required for enlarging present canal to 200 feet bottom width and 35 feet depth at mean low water, approach channels 300 feet wide:

Dredging in Buzzards Bay approach, 4,924,360 cubic yards, at 35 cents	$1,723,526
Dredging in Cape Cod Bay approach, 453,000 cubic yards, at 35 cents	158,550
Excavation main prism of canal, 9,325,486 cubic yards, at 50 cents	4,662,743
Bank protection in canal, 125,000 tons stone, at $3	375,000
Total, exclusive of breakwater or locks	6,919,819

38½. Consolidated estimate for enlarging to 40 feet depth with other dimensions the same:

Dredging in Buzzards Bay approach, 8,062,324 cubic yards, at 35 cents	$2,821,813
Dredging in Cape Cod Bay approach, 860,000 cubic yards, at 35 cents	301,000
Excavation in main prism of canal, 12,370,795 cubic yards, at 50 cents	6,185,398
Bank protection in canal, 125,000 tons stone, at $3	375,000
Total, exclusive of breakwater or locks	9,684,211

39. For the cost of breakwater in Cape Cod Bay to form a harbor at the eastern end, there will have to be added from $7,000,000 to $10,000,000, according to the extent deemed necessary. Sea locks would add to the cost an additional amount of about $5,000,000 and if built in a pair, one for entrance and one for exit, need be used only during periods of great current velocity. The use of locks would, if built at the eastern end of the canal, save some excavation from the prism, as the mean low water level of Buzzards Bay could be used entirely through the canal and the fluctuations of the tide elevations throughout the canal be confined to 4 or 5 feet instead of the 10 or 12 feet now occurring toward the easterly end.

40. It is not believed to be practicable to deepen the canal to 40 feet, without an entire reconstruction of all the bridges, which are said to be founded at about 35 feet. Nor does it appear to be a matter of questioned safety to deepen the canal to the level of 35 feet below mean low water, the depth to which the bridge piers are said to extend, with a violent current tending to scour around them. It therefore appears to be necessary to provide for protection of the pier foundations by sinking a substantial curtain of concrete for perhaps 10 feet below the base of those piers unsupported by piling, as a protection against undermining. This would involve work of this or similar character at the four channel piers of the two highway bridges and perhaps some lighter form of protection at the railroad bridge, which is supported on piles. No estimate of the cost of this protection is submitted, but it is not thought that it would exceed $100,000 for all necessary work.

41. Considering all the information which has been obtained as bearing on the subject of the purchase of the Cape Cod Canal by the United States, and if so, at what figure, I have drawn the following conclusions:

The value of the canal from a military point of view as well as commercial uses is very large, and it would be well worth to the United States the actual cost of construction, provided the expense in doing so was not too great. As to the question whether the canal can be operated safely without a lock, I should be of the opinion that during times when the greatest velocities of the tidal current exist the canal should be tied up, rather than building in the canal, the delay from which would be greater. The price which the United States should pay for the canal, if it is decided to purchase said canal, should not be greater than $8,265,743.04.

WM. T. ROSSELL,
Brigadier General, United States Army, Retired.

[For reports of the Board of Engineers for Rivers and Harbors on survey see pages 8 and 15.]

MEMORANDUM BY THE CHIEF OF ENGINEERS FOR THE SECRETARY OF WAR.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 21, 1918.

Subject: Cape Cod Canal.

1. Herewith are copies of the estimates which were prepared under my instructions of the cost to the United States of constructing the

Cape Cod Canal had it been constructed by the United States during the period when it was actually constructed by the Cape Cod Canal Co. It will be observed that one of these estimates was prepared by the district engineer at Newport, R. I., and the other by an assistant engineer in this office. Each estimate is the cost of physical work of constructing the canal, plus an estimate for land and land damages, amounting to $426,000 in one case and $537,000 in the other case, the former having omitted certain legal expenses connected with the purchase of the land which were included in the latter.

2. In addition to this land, which was purchased outright by the canal company, there was acquired from De Witt C. Flanagan approximately 1,000 acres of land, franchises and other valuable rights. Full details of this transaction are given in the papers handed you on November 23, and now in your hands.

3. There is also herewith an estimate[1] of the expenditures of the Cape Cod Canal Company from July 25, 1918, to February 15, 1919. By the item "Capital account" is meant expenditures for the improvement of the canal, i. e., additional work for enlarging or improving its facilities—in other words, betterments of the property. By "Deferred maintenance" is meant maintenance work which would ordinarily be performed each year in maintaining the project depth and the accessory works, but which on account of the financial condition of the company had not been performed. This includes shoaling in various portions of the canal and other similar work. Under "Current maintenance" is included the cost of removing deposits formed during the period covered. This item amounts to $88,500 and covers a period of approximately 6¾ months. The estimated current maintenance of the canal will be $100,000 per annum. The estimated revenues from tolls if the existing traffic be maintained is placed at $500,000 per annum.

W. M. Black,
Major General, Chief of Engineers.

ESTIMATE PREPARED BY DISTRICT ENGINEER, NEWPORT, R. I.

War Department,
United States Engineer Office,
Newport, R. I., November 14, 1918.

From: The District Engineer,
To: The Chief of Engineers, United States Army.
Subject: Cape Cod Canal.

1. In compliance with Department telegram of November 9, 1918, calling for an estimate of the probable cost of the Cape Cod Canal based on prices for similar work done by the United States during the years when the canal was under construction, including cost of excavation, breakwater, bridges, right of way, the following is submitted:

2. Cape Cod Canal crosses the glacial drift which geologists call the Wisconsin line, found in excavations and in general surface indications southward and westward of Buzzards Bay. From practical experience in glacial drift elsewhere, as in Illinois and Michi-

[1] Not printed.

gan Canal, The Hennepin, and especially on the Drainage Canal, when engineers and contractors had a free hand in developing plant and methods, it is evident that an efficient plant for the Cape Cod Canal would have cost in 1898 not less than $600,000 and probably $1,000,000, and that the work might have been done on the dimensions then proposed in about five years at a cost of not less than $8,000,000 under contracts with Department methods of close supervision and prompt monthly cash payments.

3. But it should be noted that the question of a canal across the narrow neck of Cape Cod had been raised time and again for nearly one hundred years, and when the company was at last formed and acquired the right to construct the canal, it was met with demands from De Witt C. Flanagan and associates for the purchase of franchises and equities for a canal granted by the Commonwealth of Massachusetts. If the United States had taken over the work at that date, there would have been a long delay in the courts before construction could have been authorized, and what amounts would have been authorized in the final judgment can not be estimated.

4. Payments were made in settlement, in stock, $1,810,000; in bonds, $250,000. There remain claims for damages to shipping and other causes still unadjusted of $806,887.04.

5. Assistant Engineer Parrish has prepared the following estimates based on actual cost of dredging, riprap work, and breakwater work done in these eastern engineer districts at and before the work on the canal began. The cost of bridges, rail and highway changes, land damages (except the legal cost, which seem excessive and which under United States methods would have been hardly one-tenth of the amounts stated) were taken from the report of the expert accountants. In making up the rate per cubic yard within the prism and the southerly approaches, I have charged against the first cost of plant for five years interest at 4 per cent, fire and marine insurance 12 per cent, and final impairment, excluding repairs properly chargeable to daily operations, say, 50 per cent. In other words, the amortization is not complete, but contractors or the United States should have a plant, kept up to efficient work during operation, fit for other work at about one-half of original cost, or, say, salvage. If the plant should be worked two or three shifts, the impairment account would be the same, but the charges for interest and insurance would be proportionately less.

6. For overhead charges, I estimate efficient inspection, per annum, $12,000; office and administration, per annum, $6,000; engineering, and surveys (continuous), $12,000; or for five years, $150,000. For a shorter time, the total would hardly be less as the number of inspectors would be increased while office and engineering costs would be less. On the Drainage Canal, one of the most careful contractors estimated on every item of cost in cents and fractions per cubic yard and followed operations by a daily card record of work, delays, waste, etc. Applying an approximation to his method, Assistant Engineer Parrish's estimates meet with mine. But it should be observed that these estimates are low and not likely to be approximated for years to come.

7. Excavation, scow measurement:

Approaches, 6,600,000 cubic yards, at 23 cents	$1,518,000
Prism, 11,400,000 cubic yards, at 32½ cents	3,705,000
	5,223,000
Bank protection, 142,220 tons, at $2	284,440
Breakwaters, 335,000 tons, at $1.50	502,500
Bridges	497,406
Land and land damages, right of way (not including $111,183.25 legal expenses, county commissioners, real estate agents, sundries)	426,310
Railroad changes	190,376
Highway changes	71,697
Miscellaneous: Buildings, telephone, telegraph, power and power house, ferries, equipment improvement and betterment	166,062
Contingencies, less than 9 per cent	638,209
Total	8,000,000

J. H. WILLARD,
Colonel, United States Army, Retired.

(The above estimate does not include the cost of approximately 1,000 acres of land, franchises, and other valuable rights obtained from Mr. De Witt C. Flanagan.)

ESTIMATE OF COST OF CAPE COD CANAL HAD IT BEEN CONSTRUCTED BY THE UNITED STATES, PREPARED BY ASSISTANT ENGINEER IN OFFICE OF CHIEF OF ENGINEERS.

November 13, 1918.

1. The Secretary of Commerce in his report to Congress dated September 17, 1918, states as follows:

> It will be seen that all the items listed under the headings "direct costs" and "overhead," totaling $8,091,072.37, represents actual expenditures necessary to the construction of the canal and, with possibly one or two exceptions, would have been incurred to about the same amount even if the canal had been originally constructed by the Government.

2. The division engineer in his report on the survey of Cape Cod Canal dated April 4, 1918, states "the price which the United States should pay for the canal, if it is decided to purchase said canal, should not be greater than $8,265,743.04." This latter figure evidently is taken from page 13 of report of Messrs. Price, Waterhouse & Co., of New York City, of January 5, 1918, and represents direct and overhead costs plus interests and taxes during construction. This estimate as well as the first named above includes cost of engineering, administration, organization, promotions, etc., in amounts that apparently far exceed the usual cost of superintendence, inspection, and contingencies when such work is done by the United States.

3. The prices paid for excavation under the two main contracts, namely. 18 cents and 24 cents per cubic yard, are no doubt lower than would have been the case had the character of the materials actually encountered been known when the contracts were made.

The following paragraphs are taken from a paper published in Proceedings of the American Society of Civil Engineers, by Mr. William Barclay Parsons, the chief engineer:

By this time the contractors realized that they faced a much more serious task than they had anticipated. The material contained so many bowlders and such a high proportion of cobbles, cemented gravel, and stiff clay that it could not be excavated completely by hydraulic dredges except in places, and recourse must be had to dipper machines.

The contractors were soon compelled, however, to realize that their dipper dredges, or in fact any other dipper dredges then in existence, were wholly unsuited to the allotted tasks, and that, if they were to complete the work, powerful modern equipment must be obtained.

5. These two contractors removed about 14,000,000 cubic yards of the total 15,000,000 cubic yards excavated. In view of the nature of materials encountered, it is not believed the United States could have done this work for less average unit prices than those named in these contracts. The average contract price for the total amount excavated by all contractors engaged on this work was 21.3 cents per cubic yard. The total excavation amounted to 14,978,115 cubic yards.

6. At the Isthmus of Panama, central division, cost of steam-shovel excavation, including all direct work in connection with it, but exclusive of administration expenses, for the years 1908 to 1913, both inclusive, ranged from 47 cents to 71 cents per cubic yard. Corresponding figures for the same years, but including administration, ranged from 55 cents to $1.03 per cubic yard.

7. At the Ashokan Reservoir, New York City, for work done prior to 1914, the contract price, measured in cut, for removing about 6,000,000 cubic yards of bowlder clay, and placing the same in an embankment, was 60 cents per cubic yard. The average haul was about 1 mile.

8. In constructing the filtration plant near Boston in 1911 and 1912, the actual cost of steam-shovel work in material composed of gravel with bowlders was 37.5 cents per cubic yard. This work was done by the Aberthaw Construction Co. Similar work at Springfield, Mass., in 1910 and 1911, cost 45½ cents per cubic yard. These figures cover disposal of all excavated materials.

9. Taking all things into account, the following estimate of actual cost would, in my opinion, be a fair one had the United States done the work at the time the canal was constructed:

Direct costs:	
Excavation, at 25.6 cents	$3,842,165.96
Slope protection	279,112.65
Land	537,493.38
	4,658,771.99
Breakwater	504,076.66
Bridges	521,088.85
Railway changes	190,463.72
Highway changes	62,502.01
Equipment	181,993.71
	6,118,896.94
Superintendence, inspection, and contingencies, 20 per cent	1,223,779.39
Total	7,342,676.33

Respectfully,

M. W. Lewis.

By adding to the above the work done at the approaches (3,000,000 cubic yards), the above estimate is increased $768,000, or to a total of $8,110,000.

(The above estimate does not include the cost of approximately 1,000 acres of land, franchises, and other valuable rights obtained from Mr. De Witt C. Flanagan.)

LETTER OF THE SECRETARY OF COMMERCE.

DEPARTMENT OF COMMERCE,
Washington, January 8, 1919.

MY DEAR MR. SECRETARY: For your information let me hand you memorandum received from the Railroad Administration respecting the movement of coal through the Cape Cod Canal since and before Federal control thereof:

	Gross tons.
Entire year Jan. 1 to Dec. 31, 1916, inclusive	900,000
Entire year Jan. 1 to Dec. 31, 1917, inclusive	700,000
July 25 (beginning of Federal control) to Dec. 31, 1918, inclusive (5 months, 6 days)	856,334

The above is at the rate of substantially double the largest movement under private control.

Looked at differently, the movement of coal through the canal from August 1 to December 31, inclusive, 1917, was 297,000 gross tons. The movement for the same period in 1918 under Government operation was 836,480 gross tons.

Yours, very truly,

WILLIAM C. REDFIELD,
Secretary of Commerce.

The SECRETARY OF WAR,
Washington, D. C.

Statement of tonnage and revenue for December, 1917, and December, 1918.

	Number of vessels.	Gross tonnage.	Coal tonnage.	Revenue.
December, 1918	417	315,212	153,621	$26,174.15
December, 1917	184	78,533	29,057	7,621.59
Increase	233	236,679	124,564	18,552.56

LETTER OF THE PRESIDENT OF THE CAPE COD CANAL CO.

WASHINGTON, D. C., *January 17, 1919.*

DEAR MR. SECRETARY: Confirming our conversation of this morning, we beg to advise that the canal company has outstanding $6,000,000 of 5 per cent first-mortgage gold bonds, and $2,000,000 of 6 per cent notes. The junior securities of this company are common stock to the extent of $6,000,000.

Three millions, one hundred and twenty-five thousand of the bonds are outstanding, and $2,875,000 are the property of the construction company. The latter also owns $3,337,500 of the canal company's stock.

The actual financial status of to-day is therefore as follows:

Canal company's indebtedness:	
Bonds	$6,000,000
Notes	2,000,000
Matured coupons bearing interest	40,000
Matured coupons without interest	110,000
	8,150,000
Construction company's indebtedness:	
Capital stock (sold at par for cash)	1,000,000
Floating debt	5,400,000
	6,400,000
Less bonds of canal company owned	2,875,000
Net debt	3,525,000
Total debt of both companies	11,675,000

From the above you will note that to merely free the companies from debt, and without consideration whatsoever for the stock, the sum of $11,675,000 is necessary. If interest on a million dollars, construction companies' capital stock was to be calculated at 6 per cent from the date paid in, it would add approximately, $540,000 to the above amount.

You will also note that the actual cash obligations represent approximately par for the stocks and bonds of the canal company.

Respectfully submitted

AUGUST BELMONT,
President.

The SECRETARY OF WAR.

LETTER OF DIVISION ENGINEER, NORTHEAST DIVISION.

WAR DEPARTMENT,
OFFICE OF DIVISION ENGINEER, NORTHEAST DIVISION.
New York, N. Y., July 26, 1918.

From: The Division Engineer.
To: The Chief of Engineers, United States Army.
Subject: Cape Cod Canal.

In compliance with instructions contained in telegram from the Chief of Engineers, July 25, 1918, requesting submission of estimate of cost for widening Cape Cod Canal to 200 feet and deepening canal and approaches to 30 feet, there is inclosed herewith copy of a telegram sent the Chief of Engineers, July 26, 1918, giving the information requested. There is also inclosed herewith a tabular statement giving in figures the same information contained in the telegram.

WM. T. ROSSELL,
Brigadier General, United States Army.

[Telegram.]

NEW YORK, N. Y., *July 26, 1918.*

CHIEF OF ENGINEERS, *Washington, D. C.:*

Estimated cost of deepening Cape Cod Canal and approaches to 30 feet, bottom width in canal 200 feet; the bottom width of the approaches 300 feet. Dredging Buzzards Bay approach, 2,963,577 cubic yards, at 35 cents, $1,037,251. Dredging

Cape Cod Bay approach, 269,995 cubic yards, at 35 cents, $94,498. Excavation main canal, 6,953,264 cubic yards, at 50 cents, $3,476,632. Bank protection, 125,000 tons of stone at $3, $375,000. Total, exclusive of breakwaters or locks, and without allowance for contingencies, $4,983,381.

ROSSELL.

Statement of estimated cost of deepening Cape Cod Canal and approaches to 30 feet, bottom width in canal 200 feet; the bottom width of the approaches 300 feet.

Dredging Buzzards Bay approach, 2,963,577 cubic yards, at 35 cents	$1,037,251
Dredging Cape Cod Bay approach, 269,995 cubic yards, at 35 cents	94,498
Excavation in main canal, 6,953,264 cubic yards, at 50 cents	3,476,632
Bank protection in canal, 125,000 tons stone, at $3	375,000
Total, exclusive of breakwater or locks, and without allowance for contingencies	4,983,381

WM. T. ROSSELL,
Brigadier General, United States Army.

LETTER OF THE VICE PRESIDENT OF THE BOSTON, CAPE COD & NEW YORK CANAL CO.

NEW YORK, N. Y., *January 7, 1919.*

DEAR MR. SECRETARY: Referring, if you please, to our conference of Friday, the 20th of December last, we have given much thought to your expressed opinion that the Cape Cod Canal should be acquired by the Government at a price equivalent to what it would have cost had it been undertaken and completed by public instead of private capital at the time it was constructed.

Pursuing this theory, without, however, accepting it as an equitable method of arriving at a mutually satisfactory conclusion, it has seemed to us that to express your thought in terms of dollars and cents involves questions of fact only, and that if based upon the public records and actual experience of private capital in similar undertakings, these facts should not prove especially difficult of determination.

With your permission, therefore, we have addressed ourselves to the task of ascertaining what it would have cost the Government to produce our property as it was produced by us under like time and conditions. We have been assisted in the work by engineers and contractors of wide experience in public work of similar character, and for our unit costs have used the public records since the beginning of our construction in 1911 down to the present time.

Investigation discloses the fact that in 1911, when our work was begun, the Government had no plant available for that particular construction. We have, therefore, assumed that the work would have been let to private bidders, and we submit herewith, for your consideration, a statement indicating our estimate of what it would have cost the Government to produce the property by contract.

The figures embodied in this statement represent our best and unbiased effort to arrive at the true facts, and we believe that careful checking by your exhaustive resources will not subject them to material change. We shall hope for the privilege of having our errors pointed out to us, should you find that any have occurred.

Whilst the present interests in the property are willing that the property shall pass into public ownership without profit to themselves, they feel that due consideration should, in all fairness, be given to certain items of expense such as are inevitable in private undertakings in the field of public utilities, and are generally recognized by the Interstate Commerce Commission and public service commissions everywhere as legitimate charges to construction.

Private enterprise necessitates, of course, expenditures without the scope of Federal effort along similar lines, such as corporate organization, greater cost of financing, establishment expense, etc., the legitimacy and extent of which have long since ceased to be conjectural, but which, by custom, repeated experience, and practice, have become generally recognized by well established percentages of the total capital involved. To the extent only that these accepted practices and established percentages apply to our particular case, do we ask consideration.

Assuming, therefore, that the figures embodied in the statement above referred to, are substantially correct, we respectfully submit that our figure of approximately fourteen millions is not substantially out of line with what we are justly and fairly entitled to receive for our property. More particularly does this seem to us to be the case, when it is considered that so far in our negotiation nothing has been taken into account as compensation for our long years of arduous labors nor for the risk to our capital.

In this connection, may we not ask your further indulgence in permitting us to point out some few truths incidental to our undertaking. No profits of any kind or nature, directly or indirectly, have been enjoyed by anybody. The company's executive officers have served without compensation or remuneration of any kind or character. Actual financial loss has resulted to every subcontractor in the construction; the Furst-Clark Co. alone being actually out of pocket to the extent of approximately $700,000.

The undertaking proved far greater than the most careful and painstaking preliminary investigations appeared to indicate. Unusual and extraordinary engineering difficulties were encountered, the extent of which, if realized at the beginning, would have resulted in confining the project wholly within the realm of a Federal possibility, as was the case with the Panama Canal. Notwithstanding these difficulties, however, private capital honestly invested, and economically administered, persevered in giving to the marine commerce of this country the most important and helpful facility ever enjoyed by it through any single agency.

You stated upon information and belief that the enterprise had proven a failure. That you have been misinformed is susceptible to comparatively easy proof.

Notwithstanding the comparative newness of the enterprise, and the many difficulties encountered, and which are usually incidental to the establishment of any new utility of magnitude, the company was already enjoying, when the war broke out, an income sufficient to cover its operating expenses, and to pay its fixed charge. Insufficient time had elapsed to enable us to attract to the new route more than 20 per cent of the total business naturally and logically available to us, but notwithstanding this small percentage of the total business that we had hoped, and had the right to expect to ultimately enjoy,

we had reached a self-sustaining basis. The war, with its necessary dislocation of normal traffic conditions, resulted, we are frank in saying, in practical temporary suspension of our business, and in entailing upon us a financial burden that necessitated temporarily, at least, unfortunate retrenchments in maintenance, betterments, and improvements.

Until the above mentioned contingency arose, the company enjoyed a steadily increasing business, and had conditions remained normal, we have no doubt that ere this, the property would have demonstrated its justification, from the financial point of view, beyond any question. Its wisdom and usefulness as an instrumentality of public convenience have never been questioned.

In conclusion, may we suggest that in the event of a divergence of view as to the figures we have submitted, you designate certain parties to confer with a like number selected by us, to carefully analyze the said figures, and perhaps, to establish facts acceptable to all concerned. We believe that thus a final determination of the issue may be readily realized without injustice to either party.

With reference to this latter feature, and for the purpose of acquainting you with other matters of importance, we ask the courtesy at your convenience, of a further conference with you.

Respectfully submitted.

H. P. WILSON, *Vice President.*

P. S. Since the above was written, your Secretary has been good enough to arrange a conference with you at 11.30 o'clock a. m., next Friday, the 10th.

Hon. NEWTON D. BAKER,
Secretary of War.

Statement submitted by Cape Cod Canal Co. showing the estimated cost of construction, with work done direct by the United States Government, by letting the work to subcontractors.

Excavation:		
Hydraulic dredging, 3,172,100 cubic yards, at 11 cents per yard		$348,931
Overburden removed with steam shovels, 800,000 cubic yards, at 46 cents per yard		368,000
Overburden removed with steam shovels, 1,277,600 cubic yards, at 30 cents per yard		383,280
Dipper dredging and land excavators, 9,950,300 cubic yards, at 24 cents per yard		2,388,072
Bowlders and ledge rock (over 1 yard), 800,000 cubic yards, at $8 per yard		6,400,000
Total, 16,000,000 cubic yards		9,888,283
Equivalent to 55 cents per cubic yard.		
Rights of way, for canal, changes in railroad and highways		1,000,000
Stone work:		
Breakwaters	$675,000	
Riprapping	350,000	
		1,025,000
Bridges:		
Railroad bridge at Buzzards Bay	350,000	
Highway bridges at Bourne & Sagamore	400,000	
		750,000
Railroad relocation		225,000
Changes in highways		80,000
Fixed equipment and docks		250,000
		13,218,283

Add 5 per cent for engineering and incidentals	$660, 914
	13, 879, 197
Add interest during construction, 3 years at 3½ per cent per annum	1, 457, 315
Estimated total cost	15, 336, 512

APPENDIX A.

REPORT ON EXAMINATION OF ACCOUNTS OF THE BOSTON, CAPE COD & NEW YORK CANAL CO., AND THE CAPE COD CONSTRUCTION CO., BY PRICE, WATERHOUSE & CO., NEW YORK CITY.

New York, January 5, 1918.

Brig. Gen. WM. T. ROSSELL,
Office of Division Engineer, Northeast Division,
New York, N. Y.

BOSTON, CAPE COD & NEW YORK CANAL CO.—
CAPE COD CONSTRUCTION CO.

DEAR SIR: In accordance with the instructions received from you verbally in the first instance and subsequently confirmed in your letter of November 30, 1917, we have made an examination of the books and records of the above mentioned companies from the inception up to August 31, 1917, for the purpose of ascertaining and reporting the three principal matters specified in your letter as follows:

"The total direct cost of constructing the canal.

"The total of the extraordinary expenses incident to its construction and to financing the enterprise generally, some of which may be debatable; such as administration expenses, fiscal expenses, discount on marketing securities, interest on bonds during the construction period, etc.

"The losses in operating the companies to August 31, 1917, including * * * claims against the company of large amounts for ships wrecked in the canal."

In addition we were required to compare the contracts or contract records with the books and accounts, i. e., with the vouchers covering the payments on the contracts and also to compare the data or deeds bearing upon the lands purchased for right of way for the canal proper, etc., with the entries in the books for payments therefor.

We beg to submit the following report, addressing ourselves directly to the three main matters as above, and in the order stated; the Cape Cod Construction Co. being hereinafter throughout this report referred to as the Construction Co., and the Boston, Cape Cod & New York Canal Co. as the Canal Co.

COST OF CONSTRUCTING THE CANAL.

Examination of the books and records discloses that, including (*a*) direct cost, (*b*) indirect cost or "overhead," and (*c*) interest during construction, i. e., to July 30, 1914, only, but not including (*d*) amounts paid in capital stock and bonds for rights, franchises, etc., or for services in the promotion and organization of the enterprise, or for engineering and financing, (*e*) discount on securities issued, nor (*f*) any portion of the loss or deficit on operations or damage claims pending, the cost of the construction of the canal amounted to $8,265,743.04.

Excluding, as it does, all amounts paid in capital stock, as well as the loss on operations and discount, the above total will represent the cash cost or the amount actually expended or invested in tangible property up to July 30, 1914, counting as part of the investment the interest during construction.

A summary of the items going to make up this total of $8,265,743.04 is hereto appended in Exhibit A, wherein the total is subdivided into:

(*a*) Direct expenditures—

By Construction Co	$6, 100, 500. 92
By Canal Co	142, 670. 09
	6, 243, 171. 01
(*b*) Indirect cost or overhead	1, 274, 459. 63
(*c*) Interest during construction	748, 112. 40
	8, 265, 743. 04

The direct expenditures are further subdivided therein under the heads of excavation, slope protection, land, breakwaters, bridges, etc., and the indirect into engineering, administration, organization, and promotion, fiscal, legal, etc., according to the classification adopted in the books. Particulars of the expenditure under the various subheads of excavation, engineering, etc., are given in the supplemental Exhibits A—1 to A—18, B—1 to B—7, and C, respectively, relating to (*a*) direct cost, (*b*) indirect cost, and (*c*) interest.

It will be seen from Exhibit A that the great bulk of the work embraced under the head of "direct cost" was work done by subcontractors, and we report that we inspected the contracts in respect of all such work, for which contracts were let, and in the case of all other work we saw the vouchers, minutes or other documentary evidence in respect of all payments of $100 and over, and found that the amounts charged in the books were correct in accordance with the contracts and vouchers. Having regard to the fact that estimates were duly approved by the chief engineer and important sections of the work, as they were successively completed from time to time, were approved by the Joint Board of Harbor and Land Commissioners and Railroad Commissioners, we take it that no question arises as to the payment of the moneys and the propriety of the charges to construction as shown by the exhibits.

As regards the amounts going to make up the total of $1,274,459.63 as shown in Exhibits B and B–1 to B–7, we inspected satisfactory vouchers for all payments of $100 or over. In addition, however, to the amounts listed in the exhibits, certain payments in capital stock were charged in the books as follows: William Barclay Parsons, chief engineer, $100,000, to engineering; J. B. McDonald, $250,000, to administration; August Belmont & Co., $50,000, to fiscal.

With a view to arriving in the first instance at the actual cash invested in tangible property, we have segregated these payments of $400,000 from the indirect cost and have stated them separately under the head of intangible assets, see later.

In the books of the Construction Co. all interest as and when paid whether on bonds or loans was charged to one account up to August 31, 1917, and the account was not closed as at the termination of the period of construction as at July 30, 1914, nor at the end of the several operating periods following thereafter, nor was it the practice to ascertain and record the interest accrued but unpaid at the close of the respective periods. We were accordingly under the necessity of adjusting the account with a view to apportioning the charges according to their proper incidence in the several periods and while it was not practicable to make the apportionment with absolute exactitude, it is probably sufficiently correct for all practical purposes.

As to the payments in capital stock and discount on bonds, no portion of which has been included as cost of property for the purpose of the statement in Exhibit A, the facts are as follows:

Amounts paid in capital stock.—We have reference hereunder not only to the amount of $400,000 paid to the engineer and others, as hereinbefore stated, but also to certain payments in stocks and bonds to De Witt C. Flanagan under the syndicate agreement dated May 28, 1909, which provided that of the Canal Co.'s stock to be received by the Construction Co. there was to be delivered 33⅓ per cent to De Witt C. Flanagan, the original promoter of the enterprise, for assignment (as the agreement recites) of "all of his rights * * * to the Canal Co. and against the delivery to the Construction Co. of all the capital stock of the * * * Cape Construction Co. and the ownership or muniments of title of the property and franchises of the Canal Co., together with all options for land and rights of way appurtenant to the canal as projected and * * * all real property owned and acquired by the said Flanagan along the line of the said canal * * * and all property * * * and all maps, plans, papers, and documents * * * appurtaining to the said enterprise."

In accordance with this agreement there was actually delivered to him stock of the Canal Co. of a total par value of	$2,000,000
And first mortgage bonds of	250,000
	2,250,000
Of which there was turned back by him, stock amounting to	600,000
Balance	1,650,000
To which we have added the $400,000 issued to the engineer and others and charged in the books to indirect cost as previously stated, viz	400,000
	2,050,000
Add also amount of capital stock of the Canal Co. issued to De Witt C. Flanagan in consideration of services	10,000
Total	2,060,000

Discount on bonds, etc.—Under the same agreement of May 28, 1909, before referred to, the subscribers to the syndicate agreed to purchase from the Construction Co.—

$2,875,000 bonds of the Canal Co. } for		$2,731,250
862,500 stock of the Canal Co. }		
575,000 stock of the Construction Co. for		575,000
4,312,500 for		3,306,250
Equivalent to a discount of		1,006,250
		4,312,500

This amounted in effect to a purchase of the bonds at 95 or at a discount of $143,750, with a bonus of $862,500 stock, making the total bond discount and bonus of $1,006,250.

Summing up our remarks on the cost of property, we would point out that, in segregating all amounts paid in stock and bonds for rights or services, etc., and stating these amounts separately from the actual cash investment, we have not intended to imply that no portion of such amount is proper to include as an element of cost, but that we have not taken it upon ourselves to say what proportion would be proper to include. It seemed to us it tended to clarify the accounting to state the separate figures in this way, leaving it to be determined by mutual agreement between your department and the parties in interest what would be a fair and reasonable allowance for these intangible values

RESULTS OF OPERATIONS.

A summary of the operating results is presented in Exhibit D. It will be seen that the results are stated according to the three separate periods as follows:

Period of partial operations: From July 30, 1914, to May 31, 1915.

Period of partial operations (extended): From June 1, 1915, to April 10, 1916.

Operating period proper: From April 11, 1916, to August 31, 1917.

The facts are that by May, 1914, the dredging of the canal had advanced to the stage where it became apparent it would be practicable to partially use the canal for traffic at an early date, and an agreement was accordingly entered into with the Construction Co. under date of May 26, 1914, providing for the partial operation by the Construction Co. on behalf of the Canal Co., and the canal was opened for such partial operation in accordance with the said agreement, this period of partial or temporary operation commencing July 30, 1914, and ending May 31, 1915. The agreement provided for the compensation to be paid to the Construction Co. and, in the event there was a loss, the Canal Co. was to pay half of the amount thereof and the Construction Co. the other half. Hence the division of the loss (including bond interest) for the first period equally between the two companies as shown in Exhibit D.

The reason May 31, 1915, was decided upon as the date of the termination of the period of partial operation was because of the issuance of a certificate by William Barclay Parsons, the chief engineer, in May 1915 that the construction of the canal was then completed. Accordingly all entries in the books of both companies as from June 1, 1915, were predicated on this understanding. Independently, however, of the company's engineers the contract between the Canal Co. and the Construction Co. required that certification of the joint board was a condition precedent to the acceptance of the work as completed. The board declined to so certify at the time the chief engineer did, and it was not until some considerable time later that the board agreed to furnish a certificate as to the completion of excavation at which time they decided on April 10, 1916, as the date of completion. Incidentally it should be mentioned that even up to the present time the board has not yet certified as to the completion of the canal in its entirety, but, as we understand the situation, their refusal to furnish a final certificate is based on technicalities and rests largely on their opinion that the company is obligated to build an additional bridge across the canal and the Canal Co. does not admit such obligation.

In adopting the date of April 10, 1916, the board would appear to have been guided by the fact that this was the date the Construction Co. completed the dredging of the 800,000 cubic yards which remained to be dredged when the subcontractors (the Furst Clark Construction Co.) who had charge of the work of excavation, relinquished their contract, making it necessary for the Construction Co. to undertake the dredging of the 800,000 cubic yards referred to. (See Exhibit A–1.)

But whatever date be adopted, whether May 31, 1915, or April 10, 1916, as the date of the termination of construction and commencement of operation, the essential fact remains that the canal had not yet reached a self-supporting basis, even at August 31, 1917—that is, the earnings had not sufficed to pay the operating expenses, without any

consideration whatever of interest on the bonded or floating debt. While, therefore, the deficit (and interest in addition) to April 10, 1916, must be regarded as a loss incidental to construction and, therefore, as an element of cost of the investment, the question arises whether the loss for the further period from April 10, 1916, to August 31, 1917, should not be placed on the same footing.

The deficit on public utilities during the necessary development period after the completion of the physical construction is now very generally recognized as standing on substantially the same footing as interest during the actual construction period. This principle has been generally applied for instance by the Wisconsin Railroad Commission to rate cases, the first instance being the case of Hill *v.* Antigo Water Co. in the decision of which the principles involved are very fully discussed (Wisconsin, 1909).

With this explanation we submit a synopsis of the earnings and expenses and interest charges for the three separate periods, as follows:

	Aug. 1, 1914, to May 31, 1915.	June 1, 1915, to Apr. 10, 1916.	Apr. 10, 1916, to Aug. 31, 1917.	Total.
Earnings	$25,740.72	$86,861.95	$367,099.98	$479,702.65
Expenses	82,698.51	145,704.53	407,099.24	635,502.28
Balance (deficit) before charging interest	56,957.79	58,842.58	39,999.26	155,799.63
Interest:				
On bonds	130,208.34	134,548.61	217,013.89	481,770.84
On floating debt	197,884.71	229,785.16	456,233.54	883,903.41
Federal income tax	4,951.19	773.35	.....	5,724.54
Balance (deficit) after charging interest, but before making any provision for damage claims pending	390,002.03	423,949.70	713,246.69	1,527,198.42

CLAIMS PENDING.

In arriving at the deficit as above, no provision has been made in respect of certain damage claims pending, a list of which has been furnished us with some remarks as to the present status of the claims, as follows:

Claimant.	Amount of claim.	Remarks.
Staples Transportation Co.:		
Barge Chatham	$6,000.00	Decision adverse to Canal Co. on appeal.
Tug Watuppa	54,000.00	
C. W. Chadwick & Co.: Tug Scranton	10,710.59	Awaiting decision of court.
Erie R. R. Co.: Barge Stroudsburg	1,000.00	Paid $400.
Seaboard Transportation Co.: Steamer Wm. Chisholm.	350,000.00	Verdict against Canal Co., and appealed.
White Oak Transportation Co.: Steamer Bay Port.	306,000.00	Trial set for March, 1918.
Lehigh Coal & Navigation Co.: Barge Nesquehoning	3,201.41	Awaiting trial.
Isaac Merchant: Schooner Joker II	1,500.00	Do.
New York, Ontario & Western Ry. Co.: Barge Smyrna.	4,500.00	Do.
Potter Transportation Co.:		
Barge Pequest	3,000.00	Do.
Barge Ampere	8,000.00	Do.
Sundry oyster damage claims	43,121.37	Awaiting decision on appeal of Canal Co.
New York, New Haven, and Hartford R. R. Co.: New platforms, painting, and standpipes.	21,853.67	In course of arbitration.
Total	812,887.04	
Canal Co. has filed a counter-libel claim against Bayport for.	6,000.00	Trial set for March, 1918.
Net amount	806,887.04	

As regards the three principal items in the above list, namely the claims in connection with the tug Watuppa steamship, Chisholm, and steamship Bay Port, the following particulars may be of further interest:

Tug Watuppa.—Owned by the Staples Transportation Co. Whilst towing a coal barge named the Easton during the period of temporary operation, the tug struck a rock and sank in a diagonal position across the canal. It was raised and removed.

Steamship Chisholm.—This was a vessel of 1,581 tons gross, owned by the White Oak Transportation Co. and formerly a Great Lakes collier which, in the course of proceeding through the canal on July 11, 1916, struck the canal bank and sank while being assisted by the Canal Co's. tug. The owners abandoned the wreck and the Canal Co. removed it by blowing it up.

The work did not completely interfere with traffic as the vessel had been secured to mooring dolphins before sinking. The suit brought by the owners is for $350,000 and on a first trial the Canal Co. lost the action, on the ground that the steamer was in charge of the Canal Co's. tug at the time of the accident. The Canal Co. have appealed the case.

Steamship Bay Port.—Of 1,399 tons gross, owned by Crowell & Thurlow of Boston and of the same type of vessel as the Chisholm, having been a lake collier. Whilst going through the canal on December 13, 1916, the steamer struck the bank but was secured to the side, but on the following day sheered, while in charge of the owner's wrecking crew. Tugs towed it about 1 mile further on and it then sheered again by reason of the current and struck the opposite bank, and then sank in the middle of the channel completely blocking all traffic. The owners were very dilatory in removing the wreck and secured a court injunction restraining the Canal Co. from interfering. The Canal Co. finally had the injunction vacated. Practically three months revenue is believed to have been lost until the Canal Co. removed the wreck by blowing it up. The claim is for $306,000 based on the fact that currents in the canal caused the vessel to sheer.

The expenses in connection with the Bay Port and Chisholm amounted up to August 31, 1917 to $48,184.09 and were being carried as deferred debits (see Exhibit EE) pending final disposition of the cases. The expenses in re the Watuppa amounted to $4,995.93 and have been absorbed in operating expense.

CONSOLIDATED BALANCE SHEET.

By way of a further and conclusive verification of the expenditures or outgo, it seemed eminently desirable that we should ascertain also the amount and source of the funds provided, and with this object in view we undertook to prepare and herewith submit (Exhibit E) a consolidated balance sheet as of August 31, 1917, setting forth on the one hand the property and assets acquired by the two companies considered as one and the same company, and on the other their indebtedness to the bondholders, bankers, and stockholders. It was of course necessary to first prepare separate balance sheets of the individual companies (see Exhibit EE), with which the consolidated statement may be readily identified, upon the footing that accounts owing by either company to the other are disregarded in the consolidated statement, as they must needs be for the purpose of that statement.

We have the following remarks to make on the cost of property and capitalization:

Cost of property.—The expenditures on the actual construction of the canal have already been fully explained.

With regard to the $11,990,000 charged to property in the books and in the balance sheet of the Canal Co., this was in accordance with the contract with the Construction Co., which was to receive in payment for the construction of the canal $6,000,000 first mortgage 5 per cent bonds and $5,990,000 in stock of the Canal Co. Of the total consideration of $11,990,000, stock and bonds of an aggregate par value of $10,324,800 had been paid over to the Construction Co. up to August 31, 1917, and as provided in the contract there was retained or proposed to be retained pending completion of all necessary conditions of the contract a total of $1,199,000 arrived at as follows:

	Stock.	Bonds.	Total.
Deliverable on requisitions duly approved by the chief engineer and the joint board (in full of requisitions 1 to 19 and in part payment of 20 and 21)	$5,732,000	$5,740,000	$11,472,000
Less 10 per cent retained	573,200	574,000	1,147,200
Amount actually delivered	5,158,800	5,166,000	10,324,800
Held for delivery on requisitions 20 and 21 when approved in full	258,000	260,000	518,000
Less 10 per cent to be retained	25,800	26,000	51,800
Amount to be delivered	232,200	234,000	466,200
Total delivered	5,158,800	5,166,000	10,324,800
Deliverable awaiting approval of requisitions	232,200	234,000	466,200
10 per cent retained	599,000	600,000	1,199,000
Total	5,990,000	6,000,000	11,990,000

Capital stock and bonds.—Of the $1,000,000 stock of the Construction Co., there was subscribed for in the first instance and paid in cash by August Belmont & Co. $225,000 and by De Witt C. Flanagan $200,000, and there was subsequently sold $575,000 for cash at par, as previously stated in this report.

As we have already previously stated, the whole of the $6,000,000 bonds and $5,990,000 stock of the Canal Co. have been or are to be turned over to the Construction Co.

The following is a summary showing the amount of the stock and bonds of the two companies disposed of, and whether for cash or otherwise, and the amount not yet disposed of at August 31, 1917:

	Stock.		Bonds.	Total.
	Construction Co.	Canal Co.	Canal Co.	
Total	$1,000,000	$6,000,000	$6,000,000	$13,000,000
In Treasury of—				
Construction Co.	.....	2,496,300	2,041,000	4,537,300
Canal Co	.....	831,200	834,000	1,665,200
Amount outstanding	1,000,000	2,672,500	3,125,000	6,797,500
Bonds:				
Sold for cash	.....	.....	2,731,250	2,731,250
At discount of	.....	.....	143,750	1,006,250
And bonus in stock	.....	862,500	.....	
Stock sold for cash	1,000,000	.....	.....	1,000,000
Issued to De Witt C. Flanagan et al.	.....	1,810,000	250,000	2,060,000
Outstanding as above	1,000,000	2,672,500	3,125,000	6,797,500

In our remarks relating to the cost of property we have already commented upon the item of purchase of rights, organization, etc., $2,060,000, and the discount item of $1,006,250; the remaining asset and liability items not specifically commented upon will, we believe, be self-explanatory.

Viewing the balance sheet in the light of the foregoing explanation, the main facts as to the financing and the funds provided and as to the application of those funds may be summed up thus:

Total outstanding bonds and capital stock of both companies		$6,797,500.00
Add loans and bank overdrafts		6,159,218.31
Total capital stock, bonds, and loans to account for		12,956,718.31
Which amount was expended or applied and is accounted for in the following manner, to wit:		
Construction of canal—		
Direct cost		6,243,171.01
Indirect cost, or "overhead"		1,274,459.63
Interest and taxes during construction—		
Interest	$735,482.80	
Taxes	12,629.60	
		748,112.40
Total cash cost, including interest, but not including any portion of the loss on operations nor payments in capital stock and bonds nor discount on bonds		8,265,743.04
Discount on bonds and bonus stock		1,006,250.00
Purchase of rights, organization, and promotion, etc.:		
Paid in capital stock	$1,810,000.00	
Paid in bonds	250,000.00	
		2,060,000.00
Lost in operations		1,527,198.42
		12,859,191.46
Invested in sundry working assets at Aug. 31, 1917 (net)		97,526.85
Total accounted for		12,956,718.31

EARNINGS AND MAINTENANCE BY QUARTERLY PERIODS.

In accordance with the supplementary instructions contained in your letter of December 20, 1917, we have prepared and herewith submit in Exhibit F, a statement of the gross earnings and maintenance charges by quarterly periods from the beginning of operations on August 1, 1914, supplemented by a graphic chart in Exhibit FF showing the fluctuations in the tonnage, earnings, and charges.

A statement prepared by the Canal Co.'s auditors was submitted to us (and copy may have been furnished to you, also) showing the combined expenditures for "construction, operation, and interest from the inception to August 31, 1917." While there are substantial differences between the separate totals of construction, operation, and interest and the corresponding totals as arrived at by us, these are due to changes in classification and apportionment. Thus, for instance—

The cost of construction is stated by them at		$7,922,667.88
As compared with the total, as we arrive at it, of		8,265,743.04
A difference of		343,075.16
Which is made up thus—		
Interest added by us		748,112.40
Less items we exclude from construction proper, viz:		
Payments in capital stock	$400,000.00	
Expenses in re tug *Watuppa*	4,995.93	
Petty difference	41.31	
		405,037.24
Difference as above		343,075.16

The differences on the other items may be explained in like manner. Their final total, however, of $12,866,538.98 compares with the corresponding total in our statement of $12,859,191.46 (see p. 45 hereof), a difference of only $7,347.52, which is relatively unimportant and may be dismissed from consideration.

We trust the foregoing report will meet the requirements, but shall take pleasure in supplementing it with any further information you may desire from the data in our possession.

Yours, very truly,

PRICE WATERHOUSE & Co.

EXHIBIT A.

BOSTON, CAPE COD & NEW YORK CANAL CO.—CAPE COD CONSTRUCTION CO.

Summary of cost of construction.

[Including (*a*) direct cost, (*b*) indirect cost or overhead, and (*c*) interest during construction, but not including (*d*) amounts paid in capital stock for rights and franchises or for services in promotion, organization, engineering, financing, etc., (*e*) discount on securities issued, nor (*f*) any portion of the loss or deficit on operations or claims arising out of the operations.]

	Exhibit No.	Direct cost.		Indirect cost.	Interest.	Total.
Expended by the Cape Cod Construction Co.:						
Direct cost	A					
Canal excavation	A-1		$3,842,165.96			$3,842,165.96
Slope protection	A-2		279,112.65			279,112.65
Land and land damages	A-3		537,493.38			537,493.38
Arbitration	A-4		27,134.25			27,134.25
Reconstruction of dredge Federal	A-5		26,122.73			26,122.73
Breakwaters	A-6		504,076.66			504,076.66
Bridges	A-7		497,406.53			497,406.53
Railroad changes	A-8		190,375.38			190,375.38
Highways and fences	A-9		71,697.47			71,697.47
Equipment—						
Signals and buoys	A-10	$62,332.23				
Buildings	A-11	4,604.54				
Equipment plant	A-12	21,729.61				
Lights	A-13	17,461.79				
Telegraph and telephones	A-14	536.60				
Power and power houses	A-15	15,147.52				
Ferries	A-16	3,103.62				
			124,915.91			124,915.91
Indirect cost	B					
Government and State inspection	B-1			$38,194.93		38,194.93
Engineering	B-2			322,131.46		322,131.46
Administration	B-3			254,510.56		254,510.56
Organization and promotion	B-4			208,225.28		208,225.28
Fiscal	B-5			325,000.00		325,000.00
Legal	B-6			113,128.31		113,128.31
Miscellaneous	B-7			13,269.09		13,269.09
Interest and taxes during construction	C					
Interest on bonds from inception to July 30, 1914					$550,283.39	
Interest on loans and overdrafts (net)					185,199.41	
					735,482.80	
Federal income tax					12,629.60	
						748,112.40
Total expended by Construction Co			6,100,500.92	1,274,459.63	748,112.40	8,123,072.95
Expended by Boston, Cape Cod & New York Canal Co.:						
Direct cost—						
Equipment	A-17	57,077.80				
Improvements and betterments	A-18	85,592.29				
			142,670.09			142,670.09
Total expended by both companies			6,243,171.01	1,274,459.63	748,112.40	8,265,743.04

EXHIBIT A–1.

Canal excavation.

Subcontractor (and description of work and terms).	Date of contract.	Expended. Amount.	Expended. Total.
Degnon Cape Cod Canal Construction Co. (18 cents per cubic yard, 8,436,652 cubic yards)	May 15, 1909	$1,518,597.36	
Less amount deducted on account estimated cost completing filling on Collins Farm, west end		200.00	$1,518,397.36
Furst-Clark Construction Co. (24 cents per cubic yard, 5,584,619 cubic yards)	Dec. 20, 1912	1,340,308.56	
Less amount released by contractor as per agreement dated Sept. 24, 1914		42,723.88	1,297,584.68
Degnon Cape Cod Canal Construction Co.:			
Excavated material rehandled (10 cents per cubic yard)..	June 26, 1911		
128,111 cubic yards, at 10 cents		12,811.10	
38,054 cubic yards, at 5 cents [1]		1,902.70	14,713.80
E. W. Foley Construction Co.:			
Dry excavation, 137,471 cubic yards	June 29, 1912		46,316.68
Supplies, etc., furnished	do		4,286.77
Dry excavation, 579,191 cubic yards	Feb. 28, 1913		241,197.76
Dry excavation, 74,017 cubic yards	Jan. 1, 1914		
Cost of labor and material, plus 10 per cent		60,325.53	
Cost of electric current		5,899.40	
Rental of plant, $2,000 per month		7,045.02	73,269.95
			3,195,767.00
Add amounts expended by the Cape Cod Construction Co.—			
Labor in connection with clearing canal location		1,129.55	
Labor in connection with Monument River Spillway		639.56	
Inspection of dredging equipment		300.20	
Labor and work-train service		264.13	
Sundry items of less than $100 each		983.58	3,317.02
Excavation of final 800,000 cubic yards—			
Charter and operating cost of three dredges and five scows		398,670.84	
Plant		5,143.73	
Tug rental		119,167.81	
Dikes		10,104.52	
Bowlders and blasting		51,083.01	
Sandwich yards, labor and supplies		37,516.41	
Sundries		21,395.62	643,081.94
Total canal excavation per Exhibit A			3,842,165.96

[1] For work more than half done.

EXHIBIT A–2.

Slope protection.

Subcontractor (and description of work and terms).	Date of contract.	Tons.	Expended. Amount.	Expended. Total.
Degnon Cape Cod Canal Construction Co., $2 per ton	May 15, 1909	49,739	$99,478.00	
Degnon Contracting Co., $2 per ton	Nov. 1, 1912	89,134	178,268.00	$277,746.00
Add amounts expended by the Cape Cod Construction Co.:				
Labor, slope trimming, comprising five payments of over $100 each, for which the vouchers were inspected			1,089.47	
Sundry items of less than $100 each			277.18	1,366.65
Total slope protection, per Exhibit A				279,112.65

EXHIBIT A–3.

Land and land damages.

Subcontractor (and description of work and terms).	Expended	
	Amount.	Total.
Amounts expended by the Cape Cod Construction Co.:		
Canal right of way	$311,887.37	
Spoiling	40,906.69	
Railroad right of way	50,735.61	
Change of highways	18,705.46	
		$422,235.13
Building used as offices during construction of canal	4,075.00	
Legal expenses	48,078.75	
Taxes	14,092.27	
County commissioners	3,988.00	
Salary and expenses of real-estate agent and staff	33,886.85	
Sundries	11,137.38	
		115,258.25
Total land and land damages, per Exhibit A		537,493.38

EXHIBIT A–4.

Arbitration.

Description of work and terms of payment.		Amount expended.
Furst, Clark Construction Co., dispute over yardage claimed excavated under contract; original award of arbitrators, $49,325.76; settled for $20,000; release by Furst, Clark Construction Co.; Jan. 19, 1916, inspected		$20,000.00
Mordecai F. Endicott, arbitrator in Furst, Clark Construction Co. dispute		1,712.16
Fee	$1,600.00	
Expenses	112.16	
	1,712.16	
Colin M. Ingersoll, arbitrator in Furst, Clark Construction Co. dispute		2,302.65
Fee	$2,200.00	
Expenses	102.65	
	2,302.65	
Peter C. Hains, arbitrator in Furst, Clark Construction Co. dispute		2,530.00
Fee	$2,200.00	
Expenses	330.00	
	2,530.00	
Frank L. Stevens, stenographic services in reporting proceedings May 13–17, 1915		508.00
Frederick Hale, services and expenses as clerk to corporation		60.20
Edgcomb, Nylan & Sheehan, stenographic services before joint board relative to installation of lock, tidal gates, or other devices		21.24
Total arbitration, per Exhibit A		27,134.25

EXHIBIT A–5.

Reconstruction of dredge "Federal."

Subcontractor (and description of work and terms).	Date of contract.	Amount expended.
Furst, Clark Construction Co.:		
Reconstruction of dredge Federal (new boilers, new hull, and transfer of old machinery); actual cost exclusive of betterments.	Apr. 12, 1912	$26,069.65
Add amounts expended by the Cape Cod Construction Co., sundry items of less than $100 each.	.....	53.08
Total reconstruction of dredge Federal, per Exhibit A	.....	26,122.73

EXHIBIT A–6.

Breakwaters.

Subcontractor (and description of work and terms).	Date of contract.	Tons.	Expended.	
			Amount.	Total.
Degnon Cape Cod Canal Construction Co. ($1.50 per ton)	May 15, 1909	310,782	$466,173.00	
Degnon Contracting Co. ($1.50 per ton)	Nov. 1, 1912	24,866	37,299.00	
				$503,472.00
Add amounts expended by the Cape Cod Construction Co.:				
Use of lighter Capt. Jack, towing to New London, for which voucher was inspected	.....	.....	471.25	
Sundry items of less than $100 each	.....	.....	133.41	
				604.66
Total breakwaters, per Exhibit A	.....	.....	.....	504,076.66

EXHIBIT A–7.

Bridges.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
Strauss Bascule & Concrete Bridge Co., royalty on bascule bridge (railway)	Sept. 17, 1909	.....	$4,500.00
Pennsylvania Steel Co., construction and erection of steel superstructure of Strauss trunnion bascule bridge	Feb. 18, 1910		
Structural material, 0.0385 cent per pound (1,793,388 pounds)	.....	$69,045.44	
Substructure metal delivered, 0.034 cent per pound (41,035 pounds)	.....	1,395.19	
Cast-steel bearings and shoes erected, 0.05 cent per pound (10,133 pounds)	.....	506.65	
Machinery erected	.....	16,850.00	
Bridge deck (laying in place)	.....	450.00	
Concrete counterweights in place, $6.50 per cubic yard (630.5 cubic yards)	.....	4,098.25	
Electrical equipment in place	.....	4,200.00	
Operators' house in place	.....	1,000.00	
Extras	.....	785.32	
			98,330.85
Holbrook, Cabot & Rollins Corporation, foundations for Strauss trunnion bascule bridge	Feb. 18, 1910	.....	73,500.00
Extras	.....	.....	287.46
Strauss Bascule & Concrete Bridge Co., royalty on bascule bridge (highway)	.....	.....	2,500.00
Pennsylvania Steel Co., Scherzer rolling lift bridge (highway)	July 21, 1910	.....	70,547.50
Extras	.....	.....	3,155.24
Holbrook, Cabot & Rollins Corporation, piers for Scherzer Bridge:			
Piers	Aug. 1, 1910	57,000.00	
Excavation, $3 per cubic yard (384 cubic yards)	.....	1,152.00	
Concrete for abutments and remaining piers, $10 per cubic yard (1,235 cubic yards)	.....	12,350.00	
			70,502.00

EXHIBIT A–7—Continued.

Bridges—Continued.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
Pennsylvania Steel Co., royalty on Scherzer rolling lift bridge (highway) at Bourne			$5,100.00
George S. MacLaurin:			
Painting Buzzards Bay R. R. bridge, 80 cents per ton (979.53 tons)	Oct. 20, 1910	$783.62	
Extras		8.40	
			792.02
J. Livingston & Co., hoisting apparatus and equipment complete for temporary Sagamore Bridge (apparatus $931, erection cost plus 10 per cent)	Sept. 1, 1911		1,468.08
John Taylor:			
Painting guard fences along new highways, 5 cents per linear foot of fence (6,662 feet), $333.10; extras, $4.55	Sept. 16, 1911	337.65	
Less amount to highways and fences, per Exhibit A–9		258.10	
			79.55
Wilson & English Construction Co., macadam road, iron handrail on abutment fences, etc., Bourne Highway Bridge	Aug. 17, 1911	7,700.00	
Extras		734.07	
		8,434.07	
Less amount to highways and fences, per Exhibit A–9		7,960.81	
			473.26
Degnon Cape Cod Canal Construction Co., piers and abutments, Sagamore Bridge	Apr. 1, 1912		
Piers		45,000.00	
Excavation, 85 cents per cubic yard (386 cubic yards)		328.10	
Concrete, $8 per cubic yard (700 cubic yards)		5,600.00	
Extras		651.21	
			51,579.31
Pennsylvania Steel Co., steel superstructure, Sagamore Bridge	Apr. 1, 1912	69,870.00	
Extras		63.49	
			69,933.49
Holbrook, Cabot & Rollins Corporation, temporary lift bridge at Sagamore	Aug. 3, 1911		7,420.00
Edward J. Rourke, macadamizing the south approach to Sagamore Bridge	Sept. 20, 1913		
Broken stone rolled in place, $1.90 per ton (150 tons)		285.00	
Cobblestone gutter, 85 cents per square yard (78 square yards)		66.30	
8-inch terra-cotta drainpipe in place, 50 cents per linear foot (100 linear feet)		50.00	
Catch basins of brick, including labor and material, but not frames and grates, (2) $30 each		60.00	
All extra work, cost plus 15 per cent		15.00	
			476.30
J. A. Maloney & Co., white oak for fenders of the Sagamore Bridge piers	Aug. 29, 1913		
White oak, $50 per M feet (32,796 feet)		1,639.80	
Piles, 38 cents per linear foot (10,270 feet)		3,902.60	
		5,542.40	
Less allowance as agreed		100.00	
			5,442.40
Holbrook, Cabot & Rollins Corporation: Construction of Sagamore Bridge, pier, fenders, and erection of temporary bridge at Bournedale	Nov. 20, 1913	9,500.00	
Less amount deducted as per agreement		125.00	
			9,375.00
T. A. Scott Co., erecting fenders for Buzzards Bay and Bourne Bridges	Sept. 15, 1913	6,886.00	
Extras		105.34	
			6,991.34
Norfolk Creosoting Co., piles and lumber for fenders, Buzzards Bay and Bourne Bridges	Nov. 19, 1914		
Buzzards Bay Bridge—			
224 piles (10,465 feet), at 37 cents per linear foot		3,872.05	
Sawn lumber, 36,084 feet, at $48.50 per M feet		1,750.07	
Bourne Bridge—			
224 piles, 9,275 feet, at 37 cents per linear foot		3,431.75	
Sawn lumber, 32,514 feet, at $48.50 per M feet		1,576.92	
Unloading schooner		893.09	
			11,523.88

EXHIBIT A–7—Continued.

Bridges—Continued.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
Norfolk Creosoting Co., etc.—Continued.			
Add amounts expended by the Cape Cod Construction Co.—			
Labor in connection with south approach, fill Sagamore Bridge, $1,551.41; less amount to highways and fences, per Exhibit A–9, $8.89		$1,542.52	
Labor in connection with north approach, fill Sagamore Bridge		1,082.02	
Labor in connection with temporary road at Bournedale, $833.55; less amount to highways and fences, per Exhibit A–9, $610.17		223.38	
Making test borings for proposed bridge at Buzzards Bay		2,073.68	
Inspection of materials for bridges		2,094.79	
Cost of plans, etc		195.01	
Lumber for Buzzards Bay Bridge deck (including freight)		1,016.64	
Angle iron and screws for protection of guard timbers, Buzzards Bay Bridge		114.96	
Installing service feeder at Buzzards Bay Bridge		297.60	
Installing trolley line at Buzzards Bay Bridge		807.28	
Making track changes in connection with Bourne Bridge		921.25	
Repairs on account of injury to the electrical apparatus from lightning, Buzzards Bay Bridge		266.67	
Royalty under patent rights of the Scherzer Rolling Lift Bridge Co. for construction of lift bridge at Sagamore		1,000.00	
Constructing drainage ditch on north approach to Bourne Bridge		143.93	
Strengthening board walk, Sagamore Bridge		624.03	
Half of expense towing lighter K–10 from Sandwich to Buzzards Bay		170.00	
Labor in connection with demolition of old highway bridge at Buzzards Bay		392.90	
Extra work on fenders, building drawbridge at Sagamore		367.18	
Oak piles		440.00	
Towing and driving dolphins		418.00	
Labor and power furnished for operation of Sagamore temporary lift bridge		894.74	
Premium, employers' liability insurance		100.00	
Labor and hardware furnished for fence on railroad tracks, Sagamore Bridge		282.64	
Steel material for 2 trolley poles for the Bourne Highway bridge		166.00	
Engineering service furnished in connection with the bronze bushings on Buzzards Bay Bridge		140.27	
Lighter and tug service unloading schooner Dunn		307.86	
Labor removing concrete, Bourne Bridge		158.60	
Labor tearing down Bournedale temporary bridge		127.88	
Enlarging operators' houses, Bourne and Buzzards Bay Bridges		1,304.88	
Installing motor generator sets and other electrical work		1,259.08	
4-type No. 44 automatic flagman with bell operated by 110-volt alternating-current motor control		594.00	
Labor and work train service		731.39	
Sundry items of less than $100 each		3,169.67	
		23,428.85	
Less amount collected from the Keith Car & Manufacturing Co. under provisions of contract dated July 10, 1912, being proportion of expense incurred by the Cape Cod Construction Co. in constructing overhead crossing, highway bridge at Sagamore		20,000.00	
			$3,428.85
Total bridges per Exhibit A			497,406.53

EXHIBIT A-8.

Railroad changes.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
Holbrook, Cabot & Rollins Corporation, trestle approach, Buzzards Bay Bridge	Feb. 26, 1910	$11,500.00	
Less omission of riprap		100.00	
			$11,400.00
Degnon Cape Cod Canal Construction Co., railroad relocation, alteration of highways	Dec. 29, 1010	105,184.28	
Less amount to highways and fences, per Exhibit A-9		17,480.03	
			87,704.25
C. G. Ellis overhead bridge on Woods Hole Branch (contract canceled after 92 per cent of work was completed)	Apr. 17, 1912	3,000.00	
Less 8 per cent		240.00	
		2,760.00	
Plus I-beams purchased separately		169.79	
			2,929.79
			102,034.04
Add amounts expended by the Cape Cod Construction Co.—			
Steel bridge for highway crossing over railroad at Bourne		475.00	
Changing tracks to the new drawbridge, building retaining wall and platforms, and all other work in connection with change of railroad at Buzzards Bay		27,396 59	
Reconstruction of street railway track over Bourne Highway Bridge		4,837.78	
Reconstruction of railroad, Woods Hole Branch and main line through Bourne		32,139.03	
Moving Bournedale depot and Bourne depot freight house		560.00	
Changing location of lines at Bournedale		681.24	
Work in connection with freight-yard tracks and passing sidetrack at New Bourne station		16,452.09	
Sunday labor and work train service		5,874.75	
Sundry items of less than $100 each		459.44	
		88,875.92	
Less cash received for sale of material from old lines, $284.58; cash received from sale of old highway bridge crossing now replaced by new railroad bridge, $250		534.58	
			88,341.34
Total railroad changes per Exhibit A			190,375.38

Exhibit A–9.

Highway and fences.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
Degnon Cape Cod Canal Construction Co., railroad relocation, alteration of highways	Dec. 29, 1910	$105,184.28	
Less amount to railroad changes, per Exhibit A–8		87,704.25	
			$17,480.03
John Taylor, painting guard fences along new highways, 5 cents per linear foot of fence, 6,662 feet, $333.10; extras, $4.55	Sept. 16, 1911	337.65	
Less amount to bridges per Exhibit A–7		79.55	
			258.10
Wilson & English Construction Co., macadam road, iron hand-rail on abutment, fences, etc., Bourne Highway Bridge	Aug. 17, 1911	7,700.00	
Extras		734.07	
		8,434.07	
Less amount to bridges, per Exhibit A–7		473.26	
			7,960.81
Clarence Benson, building road from Bridge Street, Bourne, to north approach of Highway Bridge			1,025.00
E. W. Foley Construction Co., highway north of canal between stations 210–260	July 16, 1912		21,711.99
W. A. Jones, construction of Hunter's Brook Road	May 24, 1913		
Stone or concrete bounds, $3 each (15)		45.00	
Clearing and grubbing, $100 per acre (1½ acres)		162.50	
Excavation, earth, 40 cents per cubic yard (4,470 cubic yards)		1,788.00	
Excavation, rock (1 yard or over), $2 per cubic yard (45 cubic yards)		90.00	
Hardening, surfacing, and constructing shoulders, 50 cents per linear foot (4,100 linear feet)		2,050.00	
Highway fences, 40 cents per linear foot (2,070 linear feet)		828.00	
All extra work not covered by unit prices, cost plus 15 per cent			4,963.50
Clarence Benson, grading, surfacing, and hardening Collins farm road	May 24, 1913		
Excavations, 32 cents per cubic yard (2,140 cubic yards)		684.80	
Shaping and surfacing		1,875.00	
Extras		10.50	
			2,570.30
Add amounts expended by the Cape Cod Construction Co.:			
Surfacing new Monument Neck Road between Bourne and Buzzards Bay		400.00	
Labor in connection with underpass at Bournedale		4,703.13	
Labor in connection with Collins farm road, east extension		681.02	
Labor in connection with temporary road at Bournedale $833.55			
Less amount to bridges, per Exhibit A–7 223.38			
		610.17	
Building guard fences, hardening, grading and repairing Bournedale Highway		4,055.95	
Constructing road to Blackwell property west of south approach, and placing loam on slopes of north approach, Bourne Highway Bridge		260.72	
Sundry grading		1,533.97	
Constructing highway and temporary footwalk for new Sagamore office		157.50	
Damage claim on account of accident due to blasting		125.00	
Government inspectors, meals		378.22	
Making fill in the new Hunters Brook Road from station 29 to the intersection of the old Hunters Brook Road		900.42	
Sundry items of less than $100 each		1,921.64	
			15,727.74
Total highways and fences per Exhibit A			71,697.47

EXHIBIT A–10.

Signals and buoys.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
Norfolk Creosoting Co., piles for mooring dolphins	Apr. 6, 1914		
Creosoted piles, 37 cents per linear foot (18,260 linear feet)		$6,756.20	
Untreated piles, 16½ cents per linear foot (17,125 linear feet)		2,825.63	$9,581.83
Add—			
Expenditures approved as per minutes of board, but not contracted for—			
Wetmore-Savage Co., poles for lights, cross arms, insulators, and line hardware, estimated to cost $3,600	Date of order. May 26, 1914	3,235.34	
Less—			
Amount to equipment, per exhibit A–12 $414.03			
Amount to power and power house, per Exhibit A–15 1,977.71			
Amount to lights per Exhibit A–13 760.98			
Amount to telephone and telegraph, per Exhibit A–14 61.96			
		3,214.68	
			20.66
General Railway Signal Co., signals authorized, $1,930			1,468.54
General Electric Co., lighting sets, etc., motor generators and cables, estimated cost, $6,125		6,788.79	
Less—			
Amount to power and power house, per Exhibit A–15 $4,924.25			
Amount to lights, per Exhibit A–13 1,729.24			
Amount to telephone and telegraph, per Exhibit A–14 27.28			
		6,680.77	
			108.02
T. A. Scott & Co., driving mooring piles, estimated cost, $11,960			12,937.97
American Steel & Wire Co., hardware		673.68	
J. S. Hoskins Lumber Co., piles, 16 cents per linear foot (45,419 linear feet, $7,267.04; clerical error in posts 10 cents.)		7,266.94	
T. A. Scott & Co., driving, $95 10 pile dolphins, $56.25, (5 pile dolphins)		8,592.25	
Mitchell, Tappeau & Co., hardware, additional mooring facilities.		222.75	
			16,755.62
Waterbury Co., hardware		749.98	
J. S. Hoskins Lumber Co., piles (16½ linear feet)		7,137.17	
T. A. Scott & Co., driving, $85.50 (10 pile dolphins)		6,669.00	
Mitchell, Tappeau & Co., hardware		292.69	
Second set of dolphins.			14,848.84
Amounts expended by the Cape Cod Construction Co.—			
Lumber for mooring berths and dolphins		269.67	
Repairing and bracing dolphins		1,967.26	
Use of lighters, etc., for pile driving at Buzzards Bay and Sagamore		3,476.59	
Sundry items of less than $100 each		897.23	
			6,610.75
Total, signals and buoys, per Exhibit A			62,332.23

EXHIBIT A–11.

Buildings.

Subcontractor (and description of work and terms.)	Amount expended.
Amounts expended by the Cape Cod Construction Co.:	
Installing heating and water systems in administration building at Sandwich	$1,639.91
Garage	480.66
Buzzards Bay shop building	275.00
Installing heating and water systems in branch office at Buzzards Bay	625.00
Lumber, cement, and sundry hardware	457.00
Sundry items of less than $100 each	1,126.97
Total, buildings, per Exhibit A	4,604.54

EXHIBIT A–12.

Equipment.

Subcontractor (and description of work and terms).	Date of contract.	Expended.	
		Amount.	Total.
New York Yacht Launch Engine Co., construction of motor launch (for tolls)	May 11, 1914	$1,900.00	
Plus extras (accessories)		673.43	
			$2,573.43
Reuben Bigelow, construction of motor launch (for tolls)	May 14, 1914	1,875.00	
Plus extras (accessories)		602.48	
			2,477.48
			5,050.91
Add—			
Expenditures approved as per minutes of board, but not contracted for—			
Wetmore-Savage Co., poles for lights, cross arms, insulators and line hardware, estimated cost, $3,600	May 26, 1914	3,235.34	
Less amount to power and power houses, per exhibit A–15, $1,977.71; amount to lights, per Exhibit A–13, $760.98; amount to signals and buoys, per Exhibit A–10, $20.66; amount to telephone and telegraph, per Exhibit A–14, $61.96		2,821.31	
			414.03
Robert F. Herrick, purchase of motor yacht Tautog	May 13, 1914		2,250.00
Amounts expended by the Cape Cod Construction Co.:			
Self-registering tide gauge		225.00	
Monument Beach pier		353.07	
Three automobiles $4,000.10			
Less allowance on old machine 575.00		3,425.10	
Four launches		2,550.00	
Installing winter cabins on two motor launches		600.00	
Three transits with fixed stadia wires, complete and sundry engineering instruments		662.10	
Office furniture and draftsman's supplies		1,375.85	
Lumber for Bournedale Ferry, mooring berths, and dolphins		1,599.48	
Portion of purchase price of plant at Sandwich and Buzzards Bay		2,000.00	
Sundry items of less than $100 each		1,224.07	
			14,014.67
Total equipment per Exhibit A			21,729.61

Exhibit A–13.

Lights.

Subcontractor (and description of work and terms).	Date of order.	Expended.	
		Amount.	Total.
Expenditures approved as per minutes of board but not contracted for:			
Wetmore-Savage Co., poles for lights, cross arms, insulators, and line hardware, estimated cost, $3,600	May 26, 1914	$3,235.34	
Less amount to equipment, per Exhibit A–12, $414.03; amount to power and power houses, per Exhibit A–15, $1,977.71; amount to signals and buoys, per Exhibit A–10, $20.66; amount to telephone and telegraph, per Exhibit A–14, $61.96		2,474.36	$760.98
General Electric Co., lighting sets, etc., motor generators and cables, estimated cost, $6,125		6,788.79	
Less amount to power and power houses, per Exhibit A–15, $4,924.25; amount to signals and buoys, per Exhibit A–10, $108.02; amount to telephone and telegraph, per Exhibit A–14, $27.28		5,059.55	1,729.24
Fred T. Ley & Co., electrical construction work, authorized $8,750		8,661.12	
Less amounts to power and power houses, per Exhibit A–15		35.51	8,625.61
Add amounts expended by the Cape Cod Construction Co.:			
Service of electrical expert		100.00	
Rubber-insulated cable, coal, and supplies		1,136.22	
Use of lighter and crew		890.00	
Rental of 30 A. G. A. lights for 8 months		1,050.00	
12 A. G. A. post lights, complete		2,236.80	
Sundry items of less than $100 each		932.94	
			6,345.96
Total lights, per Exhibit A			17,461.79

Exhibit A–14.

Telephone and telegraph.

Subcontractor (and description of work and terms).	Date of order.	Expended.	
		Amount.	Total.
Expenditures approved as per minutes of board but not contracted for:			
Wetmore-Savage Co., poles for lights, cross arms, insulators, and line hardware, estimated cost, $3,600	May 26, 1914	$3,235.34	
Less amount to equipment, per Exhibit A–12, $414.03; amount to power and power houses, per Exhibit A–15, $1,977.71; amount to lights, per Exhibit A–13, $760.98; amount to signals and buoys, per Exhibit A–10, $20.66		3,173.38	$61.96
American Steel & Wire Co., steel wire for lights, estimated cost, $1,125	May 27, 1914	1,091.45	
Less amount to power and power houses, per Exhibit		943.24	148.21
General Electric Co., lighting sets, etc., motor-generators, and cables, estimated cost, $6,125		6,788.79	
Less amount to power and power houses, per Exhibit A–15, $4,924.25; amount to lights, per Exhibit A–13, $1,729.24; amount to signals and buoys, per Exhibit A–10, $108.02		6,761.51	27.28
Western Electric Co., telephones, estimated cost, $130			133.40
Add amounts expended by the Cape Cod Construction Co., sundry items of less than $100 each			370.85 165.75
Total, telephone and telegraph, per Exhibit A			536.60

EXHIBIT A–15.

Power and power houses.

Subcontractor (and description of work and terms).	Date of order.	Expended.	
		Amount.	Total.
Expenditures approved as per minutes of board not contracted for:			
Wetmore-Savage Co., poles for lights, cross-arms, insulators, and line hardware, estimated cost $3,600	May 26, 1914	$3,235.34	
Less amount to equipment, per Exhibit A–12, $414.03; amount to lights, per Exhibit A–13, $760.98; amount to signals and buoys, per Exhibit A–10, $20.66; amount to telephone and telegraph, per Exhibit A–14, $61.96		1,257.63	
			$1,977.71
J. A. Roebling Sons Co., copper wire for lighting canal, estimated cost $6,133.04	May 26, 1914		6,111.74
American Steel & Wire Co., steel wire for lights, estimated cost $1,125	Date of contract. May 27, 1914	1,091.45	
Less amount to telephone and telegraph, per Exhibit A–14		148.21	
			943.24
General Electric Co., lighting sets, etc., motor generators, and cables, estimated cost $6,125		6,788.79	
Less amount to lights, per Exhibit A–13, $1,729.24; amount to signals and buoys, per Exhibit A–10, $108.02; amount to telephone and telegraph, per Exhibit A–14, $27.28		1,864.54	
			4,924.25
Fred. T. Ley & Co., electrical construction work, authorized, $8,750		8,661.12	
Less amount to lights, per Exhibit A–13		8,625.61	
			35.51
			13,992.45
Add amounts expended by the Cape Cod Construction Co.:			
Telegraph poles, cross-arms, and wire		559.06	
Installing electrical equipment in substation at Buzzards Bay		330.95	
Sundry items less than $100 each		265.06	
			1,155.07
Total power and power houses, per Exhibit A			15,147.52

EXHIBIT A–16.

Ferries.

Subcontractor (and description of work and terms).	Expended.	
	Amount.	Total.
Amounts expended by the Cape Cod Construction Co.:		
Motor boat for Bournedale Ferry		$1,025.00
Work on Bournedale Ferry		905.36
4 MacKenzie pontoons		175.38
10-horsepower type Z B gasoline engine No. 7103	$412.50	
Less allowance for 12-horsepower old engine returned	50.00	
		362.50
Sundry items of less than $100 each		635.38
Total ferries, per Exhibit A		3,103.62

EXHIBIT A-17.

BOSTON, CAPE COD & NEW YORK CANAL CO.

Equipment.

Description.		Amount expended.
Items of $100 and over for which the vouchers were inspected:		
Purchase and alterations to tug John C. Stuart		$50,028.99
Payments for the period November, 1914–July, 1917, on auxiliary generating set at Bourne, as per contract dated Aug. 1, 1914		2,527.53
Payments for the period July, 1916–July, 1917, on storage battery at Buzzards Bay, as per contract dated July 15, 1916		723.12
16-passenger automobile		1,445.00
Switches for storage battery at Buzzards Bay		246.55
Submarine cable		897.39
Proportion of purchase price, Sandwich pumping station, Sandwich coal-hoist station, Buzzards Bay water tank		1,500.00
Sundry items of less than $100 each		24.22
		57,392.80
Less—		
Cash received from sale of Cadillac	$200.00	
Cash received from sale of sundry equipment	115.00	
		315.00
Total equipment, per Exhibit A		57,077.80

EXHIBIT A-18.

Improvements and betterments.

Description.	Amount expended.
Items of $100 and over for which the vouchers were inspected:	
Additions and improvements to Sandwich dock, 1916–17	$10,910.96
Charter of lighters, derricks, and services of divers, blasting and slinging bowlders from bed of canal, 1916–17	25,684.12
Creosoted piles, charter of lighters and crews in connection with canal dolphins, 1916–17	29,754.21
Charter of lighter and crew for Sagamore Bridge fenders	1,513.40
Charter of lighter and crew for driving piles used as aids to navigation, 1916–17	673.25
Riprap furnished along the banks of canal, 1917	10,244.48
Services of draftsman, 1916	900.76
Style B signal mechanism for use on fog signal	196.00
Pump, 3,720 gallons per hour, complete with motor	400.00
2 bells, operated with circuit controller	485.00
Charter of lighter and crew in connection with bulkhead, Buzzards Bay	261.25
Charter of lighter and crew in connection with water dock, Buzzards Bay	270.00
Charter of dredge Federal from July 15 to 31, 1917, on dredging work	2,973.50
Sundry items of less than $100 each	1,325.36
Total improvements and betterments, per Exhibit A	85,592.29

EXHIBIT B.

CAPE COD CONSTRUCTION CO.

Summary of cost of construction of canal—Indirect cost or overhead.

	Amount.	Exhibit.
Government and State inspection	$38,194.93	B-1
Engineering	322,131.46	B-2
Administration	254,510.56	B-3
Organization and promotion	208,225.28	B-4
Fiscal	325,000.00	B-5
Legal	113,128.31	B-6
Miscellaneous	13,269.09	B-7
Total indirect cost or overhead	1,274,459.63	

Exhibit B–1.

Government and State inspection.

Col. F. V. Abbot, United States Engineer's Office (1911–1913)		$6,193.68
Col. J. Millis, United States Engineer's Office (1913–1916)		12,953.57
Treasurer Commonwealth of Massachusetts (1911–1916)		11,505.72
Lieut. Col. W. E. Craighill, United States Engineer's Office (1914–1916)		3,042.39
Sundry charge:		
Engineering	$2,773.26	
Do	756.82	
Canal excavation	711.00	
Sundry items	258.49	
		4,499.57
Total Government and State inspection		38,194.93

Exhibit B–2.

Engineering.

Salary of W. Barclay Parsons, chief engineer:	
July–December, 1909	$10,000.01
Years 1910, 1911, 1912, 1913, and 1914, at $20,000	100,000.12
January–May, 1915	8,333.35
June–December, 1915, at $2,500	1,458.34
January–Apr. 10, 1916	624.99
	120,416.81

Pay rolls, expenses, and supplies, etc.:

Year.	Pay roll at canal.	Expenses of W. Barclay Parsons's office.	Sundry expenses and supplies.
September–December:			
1909	$10,396.34	$794.41	$1,759.53
1910	24,196.42	1,109.66	7,455.35
1911	30,704.73	836.46	10,347.33
1912	33,479.71	1,531.13	7,209.79
1913	30,740.12	1,733.49	5,109.25
1914	23,277.47	1,435.54	4,641.37
January–May, 1915	.....	294.31	538.28
June–December, 1915	[1] 932.07	2,042.88	544.19
January–April, 1916	.....	215.77	274.94
Do	.....	.....	114.11
	153,726.86	9,993.65	37,994.14

Pay rolls, expenses, and supplies, etc.	$201,714.65
Salary of W. Barclay Parsons, chief engineer	120,416.81
Total, engineering	322,131.46

[1] Not including $100,000 of capital stock of the Boston, Cape Cod & New York Canal Co. turned over to William Barclay Parsons, chief engineer, and charged in the books to the cost of engineering.

EXHIBIT B–3.

Administration.

Salaries:		
J. W. Miller, vice president—		
July–December, 1909, at $20,000	$8,333.35	
Years 1910, 1911, 1912, 1913	80,000.09	
January–July, 1914	11,666.69	
August, 1914–May, 1915, at $10,000	8,333.31	
		$108,333.44
A. L. Devens, vice president, Boston—		
Years 1912–13, at $5,000	10,000.07	
January–July, 1914	2,916.69	
December, 1914	416.67	
		13,333.43
Premium on bonds:		
April, 1910, to March, 1915, at $5,000	25,000.00	
April, 1915–Apr. 10, 1916	5,138.91	
Apr. 11, 1916–Aug. 31, 1917	6,527.82	
		36,666.73
Advertising:		
Year 1910	10,000.00	
Years 1910, 1911, 1912, 1913, 1914	1,144.40	
		11,144.40
Directors' fees and traveling expenses, etc		32,869.72
Office pay roll		20,236.43
State fees and expenses, etc		12,238.15
Other expenses:		
Stationery, printing, and postage		3,498.18
Boston expenses		3,161.67
Bond trustees' fees		3,075.00
Sundry items		9,953.41
Total, administration		[1] 254,510.56

[1] Not including $250,000 capital stock of the Boston, Cape Cod & New York Canal Co., turned over to J. B. McDonald, per agreement, for services, and charged in books to cost of administration.

EXHIBIT B–4.

Organization and promotion.

Engineering:		
W. Barclay Parsons, services, 4 years, to June 30, 1909	$30,000.00	
H. W. Durham, resident engineer, salary and expenses	8,086.77	
A. S. Ackerman and H. H. Rennell, assistant engineers	3,919.51	
Michael Scretti	7,981.71	
Clemens Herschell	500.00	
W. Barclay Parsons, office disbursements	1,065.96	
Miscellaneous	703.41	
		$52,257.36
Legal:		
Samuel Untermyer (paid through De Witt C. Flanagan)	15,000.00	
Strong & Cadwalader	15,343.72	
Storey, Thorndike, Palmer & Thayer	15,542.26	
Other attorneys (paid through De Witt C. Flanagan)	11,262.25	
		57,148.23
Administration (being amounts charged to that account prior to June, 1909, subsequently transferred therefrom to organization and promotion):		
August Belmont & Co., organizing syndicate	50,000.00	
Premium on bond for construction, $750,000, for 3 years, at $5,000	15,000.00	
C. S. Sims, report on canal	3,000.00	
Canal bid, advertising, etc	10,073.83	
P. K. Tomlin, salary and expense, Boston office	7,440.03	
Rent of Boston office, February, 1906–December, 1908, at $41.67 per month	1,458.45	
Directors' fees	420.00	
Printing and franchise	2,162.38	
Publicity services	2,000.00	
Engraving bonds and stocks	7,265.00	
		98,819.69
Total organization and promotion		208,225.28

EXHIBIT B–5.

Fiscal expense.

August Belmont & Co.: Payments made in cash to bankers covering the period from June 30, 1909 June 30, 1915·

Six years, at $50,000 per annum	$300,000
Year to June 30, 1916	25,000
Total fiscal expense	[1] 325,000

[1] Not including $50,000 capital stock of Boston, Cape Cod & New York Canal Co. turned over to August Belmont & Co. as per minutes of boards, dated Nov. 19, 1913, and charged in books to fiscal expense.

EXHIBIT B–6.

Legal expense.

	Retaining fees.	Expenses, etc.
Storey, Thorndike, Palmer & Thayer, years 1910–1916	$31,750.00	$2,358.74
Cadwalader, Wickersham & Taft, years 1910–1917	72,750.00	3,263.93
Other attorneys (H. H. Baker)	1,500.00	40.64
Others		1,465.00
	106,000.00	7,128.31

Total legal expense, $113,128.31.

EXHIBIT B–7.

Miscellaneous.

Commissary:	
July, 1910–September, 1914, net expense, supplying meals to employees	$1,535.01
Income and expense:	
Balance of expenses bridge maintenance, etc., after deducting rents received from buildings on the right of way during the construction of canal	21,040.38
	22,575.39
Less income: Rents received from buildings outside canal, right of way	9,306.30
Total miscellaneous	13,269.09

EXHIBIT C.

CAPE COD CONSTRUCTION CO.

Statement of interest, etc., charged to construction, being interest, etc., accruing during the period from the inception to July 30, 1914.

Interest on $2,875,000, Boston, Cape Cod & New York Canal Co. bonds issued to members of the syndicate in four semiannual installments:

Interest period.	Number of bonds.	Interest.
1910.		
January to June	718,750	$17,968.75
July to December	1,437,500	35,937.50
1911.		
January to June	2,156,250	53,906.25
July to December	2,875,000	71,875.00
January, 1912, to July 30, 1914	2,875,000	371,354.17
		551,041.67
Less interest on amounts collected on sale of bonds by the syndicate, payment thereof to the company being deferred temporarily, interest calculated on cash balances January, 1910, to Apr. 24, 1917		61,590.26
		489,451.41
Interest on $250,000 bonds issued to DeWitt C. Flanagan, date of delivery to July 30, 1914		60,831.98
		550,283.39
Add:		
Interest on loans and overdrafts, net		185,199.41
Federal income tax proportion accruing in the period		12,629.60
Total, interest, etc. during construction		748,112.40

EXHIBIT D.

BOSTON, CAPE COD & NEW YORK CANAL CO.—CAPE COD CONSTRUCTION CO.

Statement of results of operation from Aug. 1, 1914, to Aug. 31, 1917.

	Period of paartil operation, Aug. 1, 1914, to May 31. 1915.			Period of partial operation (extended), June 1, 1915, to Apr. 10, 1916.			Operating period proper, Apr. 11, 1916, to Aug 31, 1917			Grand total.		
	Total for both companies	Proportion to Construction Co.	Proportion to Canal Co.	Total for both companies.	Proportion to Construction	Proportion to Canal Co.	Total for both companies.	Proportion to Construction	Proportion to Canal Co.	Total for both companies.	Total Construction Co.	Total Canal Co.
Income	$25,740.72	$12,870.36	$12,870.36	$85,697.11	.....	$85,697.11	$364,940.41	.....	$364,940.41	$476,378.24	$12,870.36	$463,507.88
Sundry sales	.....	.....	.....	1,164.84	.....	1,164.84	2,159.57	.....	2,159.57	3,324.41	.....	3,324.41
Total	25,740.72	12,870.36	12,870.36	86,861.95	.....	86,861.95	367,099.98	.....	367,099.98	479,702.65	12,870.36	466,832.29
Less expenses:												
Operating	71,462.46	35,731.23	35,731.23	141,408.48	.....	141,408.48	382,426.28	.....	382,426.28	595,297.22	35,731.23	559,565.99
Taxes	1,128.80	564.40	564.40	1,319.35	.....	1,319.35	2,253.50	.....	2,253.50	4,701.65	564.40	4,137.25
Insurance	.....	.....	.....	586.08	.....	586.08	13,606.22	.....	13,606.22	14,192.30	.....	14,192.30
Accidents and damages	3,086.01	1,543.00	1,543.01	2,390.62	.....	2,390.62	8,813.24	.....	8,813.24	14,289.87	1,543.00	12,746.87
Sundry charges	7,021.24	3,510.61	3,510.63	.....	.....	.....	.....	.....	.....	7,021.24	3,510.61	3,510.63
Total	82,698.51	41,349.24	41,349.27	145,704.53	.....	145,704.53	407,099.24	.....	407,099.24	635,502.28	41,349.24	594,153.04
Balance before charging interest	56,957.79	28,478.88	28,478.91	58,842.58	.....	58,842.58	39,999.26	.....	39,999.26	155,799.63	28,478.88	127,320.75
Interest on bonds	130,208.34	65,104.17	65,104.17	134,548.61	*$123,784.72*	258,333.33	217,013.89	*199,652.78*	416,666.67	481,770.84	*258,333.33*	740,104.17
Loans and advances	.....	.....	.....	7,318.41	.....	7,318.41	48,428.57	.....	48,428.57	55,746.98	.....	55,746.98
Adjustment between companies	.....	*.01*	.01	.....	.....	.....	.....	.....	.....	.....	*.01*	.01
Balance after charging bond interest but before deducting interest on Construction Co. loans	187,166.13	93,583.04	93,583.09	200,709.60	*123,784.72*	324,494.32	305,441.72	*199,652.78*	505,094.50	693,317.45	*229,854.46*	923,171.91
Interest on Construction Co. loans	197,884.71	197,884.71	.....	222,466.75	222,466.75	.....	407,804.97	407,804.97	.....	828,156.43	828,156.43	.....
Federal income tax, etc., paid by Construction Co.	4,951.19	4,951.19	.....	773.35	773.35	.....	.....	.....	.....	5,724.54	5,724.54	.....
Total deficit (both companies) [1]	390,002.03	.....	.....	423,949.70	.....	.....	713,246.69	.....	.....	1,527,198.42	.....	.....
Total deficit Construction Co.	.....	296,418.94	.....	.....	99,455.38	.....	.....	208,152.19	.....	.....	604,026.51	.....
Total deficit Canal Co.	.....	.....	93,583.09	.....	.....	324,494.32	.....	.....	505,094.50	.....	.....	923,171.91

[1] Being deficit after charging interest on bonds and loans, but before making any provision for claims pending against the two companies.

EXHIBIT E.

BOSTON, CAPE COD & NEW YORK CANAL CO.—CAPE COD CONSTRUCTION CO.

Consolidated balance sheet, Aug. 31, 1917.

ASSETS.

Cost of construction	$8,265,743.04
Purchase of rights, etc	2,060,000.00
Discount on bonds, etc	1,006,250.00
Sundry current assets	131,784.45
Deferred debits	62,177.80
Deficit on operations from July 31, 1914, to Aug. 31, 1917 (Exhibit D)	1,527,198.42
	13,053,153.71

LIABILITIES.

Capital stock:		
Construction Co.		$1,000,000.00
Canal Co.:		
Authorized	$6,000,000.00	
Outstanding		2,672,500.00
First mortgage 50-year gold bonds of Canal Co. due Jan. 1, 1960:		
Authorized	6,000,000.00	
Outstanding		3,125,000.00
Notes payable		4,713,000.00
Bank overdraft		1,446,218.31
Sundry current liabilities		96,435.40
		13,053,153.71

NOTE.—For balance sheets of the two companies separately showing also the consolidation of the assets and liabilities of the two companies into the above totals, see Exhibit EE attached.

EXHIBIT EE.

BOSTON, CAPE COD & NEW YORK CANAL CO.—CAPE COD CONSTRUCTION CO.

Balance sheets, Aug. 31, 1917.

[Showing, firstly, the assets and liabilities of the individual companies, and then (disregarding the securities and amounts owing by one company to the other) the actual investment in property and assets and the indebtedness to the bondholders, stockholders, and bankers.]

	Construction Co.	Canal Co.	Intercompany accounts (contra).	Consolidated totals.
ASSETS AND EXPENDITURES.				
Cost of property:				
Construction, including also (in the case of the Construction Co.) the indirect cost, or overhead, and interest during construction (Exhibit A)	$8,123,072.95	$142,670.09	.....	$8,265,743.04
Par value of stock $5,990,000, and bonds $6,000,000, paid or payable by the Canal Co. to the Construction Co. as per agreement of Mar. 27, 1907 (see deferred credit in accounts of Construction Co., per contra)	.....	11,990,000.00	$11,990,000.00	.....
Purchase of rights and organization and promotion, etc.:				
Amounts paid in capital stock $1,810,000, and bonds $250,000	2,050,000.00	10,000.00	.....	2,060,000.00
Discount on bonds ($143,750) and bonus stock ($862,500)	1,006,250.00	.....	.....	1,006,250.00
Stocks and bonds retained by Canal Co. under contract of Mar. 27, 1907:				

	Stocks.	Bonds.			
10 per cent of $5,990,000 stock and $6,000,000 bonds	$599,000	$600,000	.....	.....	.....
90 per cent of $258,000 stock and $260,000 bonds pending approval in full of final requisitions of $518,000	232,200	234,000	.....	831,200.00 834,000.00	831,200.00 834,000.00
	831,200	834,000			

BOSTON, CAPE COD & NEW YORK CANAL CO.—CAPE COD CONSTRUCTION CO.—contd.

Balance sheets, Aug. 31, 1917—Continued.

	Construction Co.	Canal Co.	Intercompany accounts (contra).	Consolidated totals.
ASSETS AND EXPENDITURES—continued.				
Deficit on operations from July 31, 1914, to Aug. 31, 1917 (Exhibit D)	$604,026.51	$923,171.91		$1,527,198.42
Intercompany accounts:				
For stock and bonds of Canal Co. to be turned over to Construction Co., but temporarily retained by Canal Co	1,665,200.00		$1,665,200.00	
Sundry notes and accounts receivable by Construction Co. from Canal Co	475,430.80		475,430.80	
Stock and bonds of Canal Co. held in treasury of Construction Co.—				
Stock	2,496,300.00		2,496,300.00	
Bonds	2,041,000.00		2,041,000.00	
Sundry assets:				
Fuel		13,545.42		13,545.42
Accounts receivable	14,490.20	55,376.34		69,866.54
Cash in bank	19,718.19	28,654.30		48,372.49
Deferred debits	13,993.71	48,184.09		62,177.80
Total	18,509,482.36	14,876,802.15	20,333,130.80	13,053,153.71
LIABILITIES.				
Capital stock:				
Construction Co.	1,000,000.00			1,000,000.00
Canal Co		6,000,000.00	2,496,300.00 831,200.00	2,672,500.00
First-mortgage, 50-year gold bonds of Canal Co., due Jan. 1, 1960		6,000,000.00	2,041,000.00 834,000.00	3,125,000.00
Notes payable	4,400,000.00	313,000.00		4,713,000.00
Bank overdraft	1,095,880.05	350,338.26		1,446,218.31
Intercompany accounts:				
For stock and bonds of Canal Co. retained by that company and to be turned over to the Construction Co		1,665,200.00	1,665,200.00	
Sundry notes and accounts payable by Canal Co. to Construction Co		475,430.80	475,430.80	
Sundry liabilities:				
Accounts payable	780.06	72,833.09		73,613.15
Accrued interest	22,822.25			22,822.25
Deferred credits:				
Stock and bonds of Canal Co. received or to be received by Construction Co. in payment for construction of canal, and dealt with as deferred credit pending realization	11,990,000.00		11,990,000.00	
Total	18,509,482.36	14,876,802.15	20,333,130.80	13,053,153.71

NOTE.—For condensed consolidated balance sheet embodying the totals in the last column of the foregoing statement, see Exhibit E, next preceding.

EXHIBIT F.

BOSTON, CAPE COD, & NEW YORK CANAL CO.

Comparative statement of gross earnings, tonnage, and maintenance by quarterly periods from July 30, 1914, to Aug. 30, 1917.

Period ending—	Tonnage.	Gross earnings.	Maintenance.	Percentages of increase or *decrease* over previous quarter.		
				Tonnage.	Earnings.	Maintenance.
	Tons.			*Per cent.*	*Per cent.*	*Per cent.*
Aug. 31, 1914	16,302	$7,594.35	$425.57			
Nov. 30, 1914	36,611	5,850.26	536.52	124.5	*22.9*	26.1
Feb. 28, 1915	29,247	4,040.67	1,328.35	*20.1*	*30.9*	147.5
May 31, 1915	58,555	8,255.44	567.03	100.2	104.3	*57.3*
Aug. 31, 1915	190,381	25,075.09	1,775.45	225.1	203.7	213.1
Nov. 30, 1915	292,495	23,262.22	4,185.11	53.6	*7.2*	135.7
Feb. 29, 1916	462,505	28,188.41	2,573.15	58.1	21.1	*38.4*
May 31, 1916	444,619	30,742.64	8,537.09	*3.8*	9.0	231.7
Aug. 31, 1916	1,229,128	71,123.26	9,453.74	176.4	131.3	10.7
Nov. 30, 1916	1,427,838	95,549.24	7,666.15	16.1	34.3	*18.9*
Feb. 28, 1917	268,208	35,286.74	30,052.34	*81.2*	*63.0*	292.0
May 31, 1917	420,661	39,272.65	33,392.87	56.8	11.2	11.1
Aug. 31, 1917	1,175,124	105,461.68	22,966.09	179.3	168.5	*31.2*
	6,051,674	479,702.65	123,459.46			

NOTE.—Maintenance includes maintenance of canal, dolphins, ferry, signals, buildings, bridges, lighting equipment, and motor launches.

In the case of canal, the maintenance charges relate to the period from Apr. 11, 1916, and in the case of dolphins and ferry from June 1, 1915.

All other maintenance relates to the whole period from Aug. 1, 1914, to Aug. 31, 1917.

LETTER OF THE SECRETARY OF THE NAVY.

NAVY DEPARTMENT, *Washington, September 21, 1917.*

To: The Secretary of War.

Subject: Data in regard to the Cape Cod Canal.

1. Replying to your letter[1] of August 23, 1917, inviting my attention to the accompanying extract from the river and harbor act of August 8, 1917, concerning the Cape Cod Canal, and requesting a statement of data and evidence that the Navy Department desires incorporated in the report of survey which is to be conducted under your direction, I have the honor to inform you that the Navy Department will be pleased to have the following information incorporated i the report of the survey, in order that the department may fully understand the conditions existing in the Cape Cod Canal region, and in order that it may arrive at a full appreciation of the obligations the Government is to assume in case of the purchase and operation of the property in question:

(*a*) The present depth of water in canal; the total cost of dredging since canal was opened for traffic; the yearly cost of maintaining the present depth; the difficulties which have been encountered in dredging and in keeping the canal open; the reasons why the canal has not been deepened and maintained in accordance with the provisions of the charter, which require that the canal "shall have a depth of not less than 25 feet at mean low water, a width of not less than 100 feet at the bottom, with suitable slopes, and a surface width of not less than 200 feet."

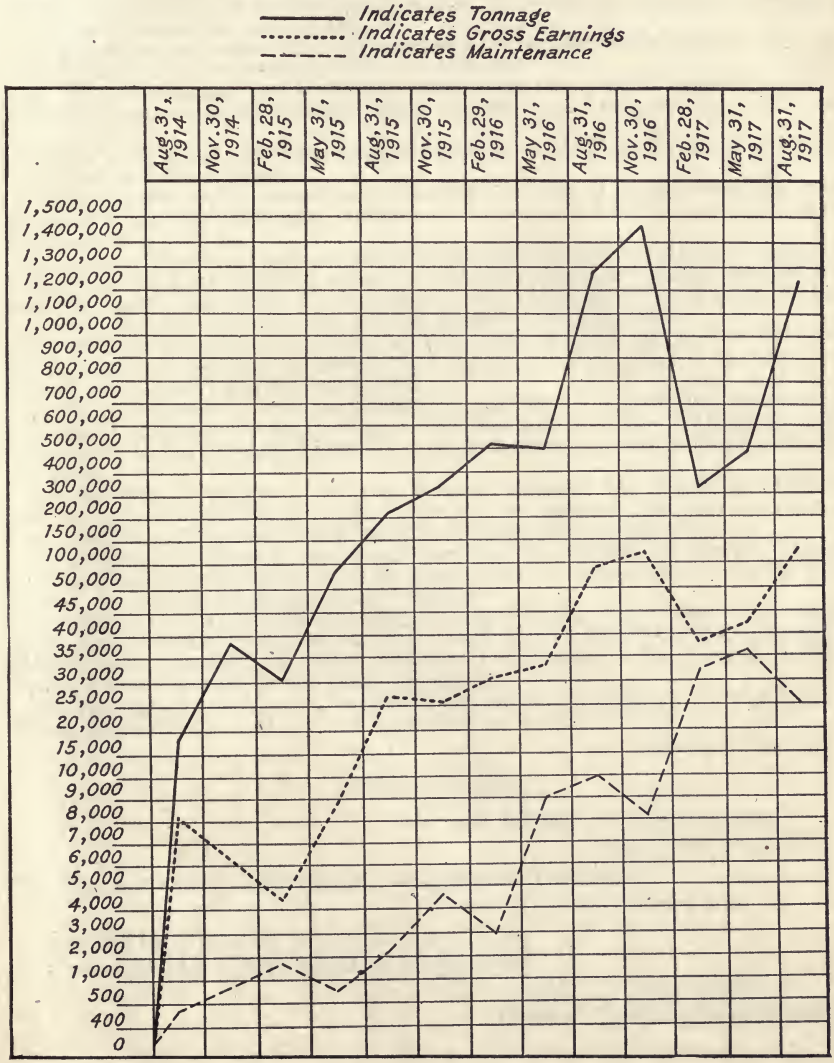
[1] Not printed.

APPENDIX A.

EXHIBIT FF.

CHART INDICATING FLUCTUATIONS IN TONNAGE, GROSS EARNINGS AND MAINTENANCE FROM JULY 30, 1914, TO AUGUST 31, 1917.

[Boston, Cape Cod & New York Canal Co.]



(*b*) The dredging and bulkhead work necessary to deepen and widen the canal to 35 feet at mean low water with a bottom width of at least 200 feet, the width of the Culebra Cut; slopes of about 3 to 1; the extension of this canal prism beyond the present terminals in both Cape Cod Bay and Buzzards Bay; the initial estimated cost of the canal so constructed and the cost of maintenance; the estimated time required to complete the waterway for operation.

(*c*) The same data and estimates if the canal has a bottom width of 200 feet and depth of 40 feet at mean low water.

(*d*) The extent of breakwater construction to maintain the waterway as above in (*b*) and (*c*), beyond present canal terminals, and the estimated first cost and cost of maintenance in each case.

(*e*) The extent and estimated cost of new bridge construction to permit passage of vessels, 140 feet clear in center of span; and of the additional equipment necessary to operate the enlarged canal (*b*) and (*c*).

(*f*) The extent and estimated cost (initial and maintenance) of navigation light and buoy systems and other necessary aids to navigation.

(*g*) If it is determined that locks are necessary, the number and character of locks, pumping systems, and the estimated initial cost and cost of maintenance, for (*b*) and (*c*).

(*h*) The number and character of tugs required for service of the canal; the estimated initial cost and maintenance.

(*i*) The character of fortifications and batteries and size of garrisons decided to be necessary to protect both canal entrances, with estimated initial cost and cost of maintenance.

(*j*) An investigation of current velocities through present canal; tides; action of currents in silting up canal; an estimate of current conditions with the enlarged and deepened canal (*b*) and (*c*); difficulties which may be encountered in keeping required depth in extension of canal prism beyond present canal terminals.

(*k*) Duration and character of fogs at both canal terminals throughout the year; the percentage of fogs; the influence which fogs and ice have had in the past upon the use of the canal by deep-draft vessels.

(*l*) An investigation of weather conditions, and the influence of prevailing winds upon canal navigation by heavy ships; whether in past operation difficulty has been experienced in heavy weather in safely making the entrances and in passing through the canal.

(*m*) Whether heavy ships may pass through enlarged and deepened canal (*b*) and (*c*), under own power, or whether tugs will be required; influence upon heavy ships navigating the canal of tidal currents and transverse, strong winds.

(*n*) Determine definitely what obligations must be assumed by the Government with purchase of canal—such as those enumerated in sections 14, 15, 16, 20, 21 of charter, now carried by the operating company.

(*o*) The testimony of coastwise shipping companies using the canal as to time saved by such use; certainty of operation; delays and to what they were due; navigation difficulties encountered, especially those due to restricted width of canal, and the effects of tidal currents, strong winds, fog and ice.

(*p*) The reasons for the abandonment of the use of the canal by the Merchants & Miners Steamship Co., and the New England Coal & Coke Co.

JOSEPHUS DANIELS.

[Second indorsement.]

OFFICE CHIEF OF ENGINEERS,
September 28, 1917.

To the DIVISION ENGINEER, NORTHEAST DIVISION,
New York City:

For his information and guidance.
By command of the Chief of Engineers:

H. C. NEWCOMER,
Colonel, Corps of Engineers.

[Third indorsement.]

OFFICE DIVISION ENGINEER, NORTHEAST DIVISION,
New York City, April 4, 1918.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

Returned, inviting attention to report of this date on survey of the Cape Cod Canal, accompanying which, and marked Appendix B, are the answers to the above questions asked by the Secretary of the Navy.

WM. T. ROSSELL,
Brigadier General, United States Army, Retired.

APPENDIX B.

ANSWERS TO QUESTIONS ASKED BY THE SECRETARY OF THE NAVY IN HIS LETTER DATED SEPTEMBER 21, 1917, TO THE SECRETARY OF WAR.

PARAGRAPH (A).

Question 1: "What is the present depth of water in canal?"

With the exception of three recurring shoals of an area not exceeding in each case 500 feet in length, the minimum depth of the canal at low water is 25 feet. The problem of maintaining a 25-foot depth through the entire canal is concentrated in these three shoals, experience having shown that at no other points in the canal does any appreciable shoaling occur. From time to time, as necessity required, and as rapidly as dredging equipment could be obtained and operated in the canal without seriously interfering with navigation, these shoals have been removed. Their recurrence, however, has demonstrated the necessity of practically a constant dredging operation to maintain the full depth of 25 feet. Owing to the fact, however, that in the original estimates of the engineers it was contemplated that 250,000 yards of material per year would have to be dredged out of the canal, and so far it has been found necessary to remove only approximately 40,000 yards, this problem is not a serious one, and will, it is believed, become less as the action of the tides through the canal tends to bring all material to permanent rest. The fact will be appreciated that a small shoal showing a depth of 22 feet of water, to all intent and purposes establishes that depth for the entire canal, yet the actual conditions show that over 95 per cent of the total canal distance is at a depth in excess of the required 25 feet; in fact, while shoaling occurs in the spots referred to, scouring has occurred in other areas, with the result that in many places a depth of 30 feet seems to be permanently established.

Question 2: "What has been the total cost of dredging since canal was opened for traffic?"

In order that an answer to this question may be clearly understood, it may be well to point out that the canal was opened for light traffic when a minimum depth of 19 feet had been reached. Dredging operations were continued, however, until April 10, 1916, when the final depth of 25 feet was obtained and the canal thrown open for its maximum use, and accepted for such use by the joint board of the State of Massashusetts. The dredging operations that were conducted between the time of the original partial opening of the canal and April 10, 1916, were of course part of the original construction of said canal. From and after April 10, 1916, however, the cost of dredging, coming under the head of maintenance, has amounted to $62,155.42.

Question 3: "What is the yearly cost of maintaining the present depth?"

Taking, as a basis of calculation, the cost of maintaining the canal to its minimum depth of 25 feet for the period between April 10, 1916, and August 31, 1917, the average yearly cost would approximate $43,750. However, this actual cost does not represent fairly the annual cost of maintaining the canal prism, because during the period from January 1, 1917, to June 30, 1917, the major portion of this actual excavation work was done and the accumulated fill from the time construction had ceased was removed from the various portions of the canal. The above cost if spread over the period from July 29, 1914 (the commencement of operations), to August 31, 1917, would give an annual maintenance cost for dredging of $20,158.52. It is believed that as time goes on and the loose material in the canal prism finds permanent rest, the annual maintenance cost will be materially reduced from these figures. Actual experience in such maintenance would seem to fully justify this conclusion.

Question 4: "What are the difficulties which have been encountered in dredging and in keeping the canal open?"

No material or extraordinary difficulties whatsoever have been encountered in dredging and in keeping the canal open. Occasional bowlders have been encountered, but their removal has not been a difficult task. Keeping open the canal, rather than being a difficult problem, is an exceedingly simple one, depending almost entirely upon the availability of a small amount of dredging equipment.

Question 5: "What are the reasons why the canal has not been deepened and maintained in accordance with the provisions of the charter, which require that the canal shall have a depth of not less than 25 feet at mean low water, a width of not less than 100 feet at the bottom with suitable slopes and a surface width of not less than 200 feet?"

Since April 10, 1916, the required depth, width, and suitable slopes have to all practical intent and purpose been maintained. As above stated, certain shoals have occurred and have been removed as rapidly as the operating conditions of the canal and the available apparatus would permit. At the present time there are three small shoals in the canal where the minimum depth of water is 22 feet. These shoals are now in process of removal.

PARAGRAPH (B).

Question: "The dredging and bulkhead work necessary to deepen and widen the canal to 35 feet at mean low water with a bottom width of at least 200 feet—the width of the Culebra cut; slopes of about 3 to 1; the extension of this canal prism beyond the present terminals in both Cape Cod Bay and Buzzards Bay; the initial estimated cost of the canal so constructed and the cost of maintenance; the estimated time required to complete the waterway for operation."

To dredge the canal to 35 feet at mean low water with a bottom width of 200 feet, with slopes 3 to 1, would entail the excavation of 20,000,000 cubic yards, including the dredging of the Cape Cod Bay and Buzzards Bay approaches beyond the present terminals. It is not believed that a 3 to 1 slope is necessary except in the approaches where the cutting will be shallow. The slope of the present canal prism or canal proper is 2 to 1 and has been proven sufficient. The foregoing estimate, based on a 2 to 1, slope, is 15,000,000 cubic yards.

The bottom width of the Culebra cut in the Panama Canal is 300 feet.

The cost of a canal 35 feet deep and with a bottom width of 200 feet and slopes of 3 to 1, with an estimated excavation of 20,000,000 cubic yards, would be $9,000,000, based on the cost of the present canal, and includes maintenance of travel during the period of widening and deepening. This does not include interest during construction or overhead costs. The maintenance cost of such a canal would be probably 50 per cent over the actual cost of the present canal or about $75,000 per annum.

The cost of a canal 35 feet deep and with a bottom width of 200 feet and slopes of 2 to 1, with an estimated excavation of 15,000,000 cubic yards would be $7,000,000, including maintenance of travel during widening and deepening but not including interest during construction or overhead costs. The maintenance cost of said canal would be slightly larger on account of the steeper slope, but experience with the slopes of the present canal would warrant the assertion that on account of the material being hard and firm, especially at the lower levels, the annual maintenance cost would not exceed $80,000 to $90,000 per annum.

The estimated time of completion after the equipment had been assembled would be in the case of a canal having a 2 to 1 slope about 18 months, and in the case of a canal with a 3 to 1 slope, 2 years.

PARAGRAPH (C).

Question: "The same data and estimates if the canal has a bottom width of 200 feet and depth of 40 feet at mean low water."

If the canal bottom were increased to a width of 200 feet and a depth of 40 feet at mean low water, the excavation based on a 3 to 1 slope would by 27,000,000 cubic yards, or if the slope was made 2 to 1 the excavation would be 21,500,000 cubic yards, including the dredging of the Cape Cod Bay and Buzzards Bay approaches beyond the present terminals.

The cost of a 200-foot bottom width with a depth of 40 feet at mean low water based on a 3 to 1 slope would be $12,000,000, and with a slope of 2 to 1 the cost would be about $10,000,000 based on the cost of the present canal, including the maintenance of travel during the period of widening and deepening. This does not include interest or overhead costs during construction. The maintenance cost of such a 40-foot canal is

difficult to determine, but can be estimated at $100,000 per annum for a canal based on a 3 to 1 slope, but if the slope is made 2 to 1 the cost would be very slightly increased.

The time required for the construction of a 40-foot canal with slope of 3 to 1 would be three years, and with a slope of 2 to 1 the time would be two and one-half years after the equipment had been assembled, assuming as in paragraph (*b*) the maintenance of travel in the canal during reconstruction.

PARAGRAPH (D).

Question: "The extent of breakwater construction to maintain the waterway as above in (*b*) and (*c*), beyond present canal terminals, and the estimated first cost and cost of maintenance in each case."

If the canal is deepened to 35 feet and widened to 200 feet, the breakwater at the Sandwich entrance should be lengthened about 250 feet, requiring 100,000 tons of rock at a cost of about $300,000.

If the canal is deepened to 40 feet and widened to 200 feet, the breakwater should be lengthened about 500 feet, requiring 200,000 tons of rock at a cost of about $600,000.

PARAGRAPH (E).

Question: "The extent and estimated cost of new bridge construction to permit passage of vessels, 140 feet clear in center of span; and of the additional equipment necessary to operate the enlarged canal, (*b*) and (*c*)."

With a canal widened to 200 feet and deepened to 35 feet there would be no necessity of reconstructing the bridges, but it would be necessary to reconstruct the fenders at a cost of $50,000.

If the canal were widened to 200 feet and deepened to 40 feet, the foundations of all the bridges would have to be rebuilt, and the estimated cost would be $300,000.

Attention is called to the fact that the canal as constructed had been planned to be widened to a width of 200 feet and a depth of 35 feet, and to go beyond this depth entails the excess cost of $300,000, mentioned in this paragraph.

PARAGRAPH (F).

Question 1: "What is the extent and estimated cost (initial and maintenance) of navigation light and buoy systems and other necessary aids to navigation?"

Lights.—The prism of the canal is lighted with incandescent lights set on poles 500 feet apart. The lights are opposite each other, enabling ships to keep in the middle of the channel. The lights in the Buzzards Bay approach will be referred to later under "Other aids to navigation."

The Canal Power Associates (a consolidation of local power companies, in which the Canal Co. is not interested directly or indirectly) furnishes the electric current from their large plants at Plymouth and New Bedford, and several independent connections are made for use in case of emergency, and in order further to assure illumination at all times, and to make certain of sufficient power for the opening of the bridges, an auxiliary generating set is installed at the power station near the Bourne highway bridge. This auxiliary set can be coupled up and put in operation inside of four minutes. Further, a complete storage-battery plant is installed at the Buzzards Bay Railroad bridge, on north bank of canal. It is continually charged, ready for instant use.

Buoys.—Buoys have not been used within the prism of the canal, for the reason that in a waterway of restricted width the position of the buoys would change. Therefore, a series of dolphins have been installed at each entrance, also on each side of all the bridges, and at other points where considered expedient. These are driven on the 15-foot depth, with generally 10 piles to each dolphin. The total number within the prism is 127 and the initial cost per dolphin was approximately $285, making a total for all dolphins within the prism of about $36,195.

These figures do not include the renewal of certain dolphins, which was necessary on account of the action of the teredo and other causes.

The initial cost of the electric lighting system, namely, purchase of poles, stringing wire, placing incandescent lights, etc., was approximately $20,000.

The Canal Power Associates furnishes the current (as stated above both for lighting and operation of bridges) at the rate of 3½ cents per kilowatt-hour. The Canal Power Associates contract to maintain a reserve of 100 per cent over the maximum demand.

The cost of electric power for all the canal requirements is arbitrarily apportioned, one-third for lights, one-third for the two highway bridges, and one-third for the railroad bridge at Buzzards Bay.

Other aids to navigation and the cost thereof.—In addition to the installation by the Government of permanent aids to mark the approach channel in Buzzards Bay and the approach channel to the Sandwich entrance, the Cape Cod Construction Co. erected in Buzzards Bay a large number of dolphins and buoys which mark the approach channel from Wings Neck to the canal entrance at Bourne Neck, a distance of about 5 miles. These dolphins also serve the purpose of mooring dolphins, especially opposite Hog Island, to enable vessels to tie up and await passage of vessels coming against them through the canal. These aids to navigation and the maintenance thereof, including the cost of certain mooring dolphins at the Sandwich entrance, for one year amounted to about $22,500.

From time to time the Department of Commerce has replaced the majority of the lighting dolphins in Buzzards Bay and maintains there its own buoys and aids to navigation, as these are Government waters.

At the eastern end the Canal Co. originally placed its own buoys to mark the southern end of the channel abreast the breakwater. These were later replaced by the Government.

The Lighthouse Department installed at Federal expense the light tower near the end of the breakwater, and pays the maintenance cost thereof.

In addition to the aids to navigation at the eastern end, the Canal Co. at its own expense has erected two signal staffs on the south bank of the canal as range lights.

The United States Weather Bureau erected and maintains its tower on the north bank of the canal near the shore end of the breakwater.

The dispatching system for operating the canal may also be justly called a material aid to navigation. It consists of flags and lights on poles at each end of the canal, and a system of telephonic communication between the main office at Buzzards Bay and from bridge to bridge; thus controlling the passage of vessels in a manner similar to the dispatching done by railroads.

There is also maintained at Wings Neck a signal station, through flags and lights, and an operator, for the purpose of controlling the entrance of vessels into the dredged channel.

PARAGRAPH (G).

Question: "If it is determined that locks are necessary, the number and character of locks, pumping systems, and the estimated initial cost and cost of maintenance for (*b*) and (*c*)."

It is believed that locks are not only unnecessary, but impracticable, and that they would result in not only delaying traffic but make traffic quite impossible during the winter months. The estimated cost of a lock scheme of the size believed to be requisite and based on a depth of 35 feet with a main lock having a width of 110 feet and a length of 1,000 feet, with an auxiliary lock 50 feet wide and 245 feet long, would be $5,500. The locks could be built of Massachusetts concrete resting on piles and should be provided with double sets of steel miter gates.

The pumping system would consist of seven 200-horsepower motor-driven centrifugal pumps.

If the canal were deepened to 40 feet, the cost of said lock system with pumping system complete would be $7,000,000.

The cost of maintenance can be estimated at 1 per cent of the initial cost per annum, or $55,000 per annum for a 35-foot depth and $70,000 per annum for a 40-foot depth.

This cost of maintenance, however, should be ample to take care of the operating pay roll, as the concrete construction would require very little maintenance upkeep and the principal maintenance would be repairs to the pumping machinery and electrical equipment.

PARAGRAPH (H).

Question 1: "The number and character of tugs required for service of the canal, the estimated initial cost and maintenance."

In the opinion of this office, there should be maintained at the canal a sufficient amount of towing power to insure reasonably prompt and efficient dispatch of all traffic. This, of course, can only be demonstrated through actual experience based upon the volume of traffic to be handled. The Canal Co. has not undertaken to do a towing business through the canal, but has endeavored to maintain a sufficient amount of towing power for its own requirements in the maintenance and operation of its property. At the present time there is at the canal one large seagoing tug of approximately 750 horsepower. This tug is available for towing purposes when not otherwise employed in the maintenance and operation of the canal. This tug was purchased at a cost of $50,000, and is maintained and operated at an annual cost of approximately $42,000.

In the opinion of this office, two additional tugs of a similar capacity, with the employment perhaps of two or three motor boats equipped with heavy-duty engines, would be sufficient to insure prompt and efficient service for any increase of traffic through the canal.

PARAGRAPH (I).

Question: "The character of fortifications and batteries and size of garrisons decided to be necessary to protect both canal entrances, with estimated initial cost and cost of maintenance."

The western terminus of the Cape Cod Canal lies in Buzzards Bay. The plans of the War Department Board of Review call for the installation at Fort Rodman, New Bedford, of two 12-inch howitzers, mounted in fixed positions, for the purpose of denying Buzzards Bay to a naval enemy. The cost of gun emplacements and carriages for these howitzers—the howitzers themselves are understood to be on hand—will be $310,000. The cost of the accessories for this armament—that is, ammunition, fire control, searchlights, and power plants—will amount to $240,000 additional.

Two 12-inch howitzers on fixed mounts will be sufficient for the defense of the eastern terminus of the canal against naval attack. The cost of the two 12-inch howitzers and their accessories would be the same as the cost given above for the same armament at Fort Rodman.

Two companies of Coast Artillery for both entrances, with the necessary barracks, kitchens, storehouses, roads, etc., is thought to be sufficient garrison for the necessary protection of the canal. These are estimated to cost about $352,000, plus the pay and allowances for the troops to be stationed there, which may be estimated at about $480,000 per annum.

PARAGRAPH (J).

Question 1: "An investigation of current velocities through present canal; tides; action of currents in silting up canal; an estimate of current conditions with the enlarged and deepened canal (*b*) and (*c*); difficulties which may be encountered in keeping required depth in extension of canal prism beyond present canal terminals."

The canal current velocities are fully described in a paper written by Lieut. Col. William Barclay Parsons, Eleventh Engineers (Railway), United States Army, which was presented October 3, 1917, before the American Society of Civil Engineers. Copy is herewith attached, marked "Exhibit A."[1]

The tides are most elaborately described in that paper.

If the canal were deepened to 35 feet and widened to 200 feet, the current velocities would be increased to an inappreciable degree, possibly a tenth of a knot, and if widened to 200 feet and deepened to 40 feet the increase in velocity of the current might possibly go to two-tenths of a knot.

The silting in the canal takes place at points where the canal widens. This silting is decreasing month by month.

There are no special difficulties in keeping the required depths of water at either end of the canal, except the occasional dredging previously referred to.

PARAGRAPH (K).

Question 1: "Duration and character of fogs at both canal terminals throughout the year; the percentage of fogs."

The Government report for five years, namely, from 1909 to 1913, inclusive, gives the following fog figures:

	Hours.
Pollock Rip	1,066
Wings Neck	459
Bird Island	276
Gurnet (Plymouth)	625

The fog figures naturally change each year, but statistics compiled since the opening of the canal show approximately the same result. Gurnet is only 16 miles north from the eastern end of the canal. It will be noted that comparing the 1,066 hours at Pollock Rip with the average fog hours at Wings Neck, Bird Island, and Gurnet (namely, 453 hours), the fog through the canal is 60 per cent less than along the outside route.

Question 2: "The influence which fogs and ice have had in the past upon the use of the canal by deep-draft vessels."

[1] Not printed.

Fogs.—Sea fog has seldom interfered with the passage of ships through the canal. Fogs from New Bedford to Wings Neck are of less density than through Nantucket Sound.

The passenger steamers *Bunker Hill* and *Massachusetts*, 4,779 gross tons each, 375 feet long, 52.2 foot of width, have during the past season navigated daily through the canal with scarcely any interruption or delay on account of fog.

Ice.—Ice has never materially interfered with navigation in the eastern end of the canal; nor has the passage of vessels been materially interrupted, even in the coldest weather, at the western end except during a short period of winter. The reason for such interruption last winter was that the canal was blocked by a wreck and no attempt was made to keep the Buzzards Bay entrance open.

There would have been no more difficulty, however, in keeping the western-approach channel open, with ice-breaking tugs, than is experienced every winter at Providence or Boston; in other words, had there been no blockade of the canal last winter, the daily traffic would have kept an open channel through the ice in the Buzzards Bay approach channel. The winter of 1916–17 was an exceptional one, and many aids to navigation were carried away at all points on the north Atlantic coast. The aids to navigation of the Cape Cod Canal were up to that time largely temporary in character. Steps have since been taken by the Department of Commerce to install more modern and permanent aids less susceptible to injury by floating ice.

PARAGRAPH (L).

Question 1: "An investigation of weather conditions, and the influence of prevailing winds upon canal navigation by heavy ships; whether in past operation difficulty has been experienced in heavy weather in safely making the entrances and in passing through the canal."

The weather conditions are fully described in Exhibit A.[1]

Buzzards Bay is a safe anchorage for eastbound vessels from easterly storms, and vessels bound west from Boston, if caught in a "northeaster," can now run for Plymouth, Provincetown, or Sandwich entrance of canal. Vessels coming into the eastern entrance to the leeward of the breakwater can tie-up to the dolphins on both sides of the canal if necessary.

The large steamers of the Eastern Steamship Corporation, making daily passages, have never been prevented, through tidal currents, transverse or strong winds from passing through the canal.

There have been no difficulties of any kind on account of the wind with vessels entering the canal from the west. At the easterly end, however, some slight inconvenience has been found by tows in shortening their lines off the breakwater. An additional transverse breakwater would obviate this difficulty and create an ideal harbor of refuge for vessels which could not make Plymouth or Provincetown.

PARAGRAPH (M).

Question 1: "What is the influence upon heavy ships navigating the canal of tidal currents and transverse, strong winds? Whether heavy ships may pass through enlarged and deepened canal, (*b*) and (*c*) under own power, or whether tugs will be required."

The tidal currents (head tide) naturally retards to a degree the passage of all vessels, heavy ships of low power and loaded barges being more seriously affected thereby, but no case of material delay due to the current has been experienced. The two accidents to heavy vessels which have occurred in the canal were mainly due either to defective steering mechanism or to incompetence on the part of the navigators, as well as antiquated type of vessel and deficient power.

The only craft, while passing through the canal which could be affected by transverse winds are light barges which present much freeboard to the wind, when empty. The prevailing winds are northeast and southwest, and as the canal runs in the same general direction there is scarcely any transverse wind.

Heavy ships would be able to very readily pass through the canal if it were widened, and, of course, the deeper the canal the greater the draft could be of vessels using the canal. No serious criticism has ever been made of the canal except as to its narrowness. It is believed that widening the canal will overcome all criticism that has been made by navigators. No objection has ever been made on account of the velocity of the current except that it made navigation more difficult on account of the present width of the canal.

---

[1] Not printed.

PARAGRAPH (N).

Question 1. "Determine definitely what obligations must be assumed by the Government with purchase of canal, such as those enumerated in sections 14, 15, 16, 20, 21 of charter, now carried by the operating company."

Section 14.—This has been entirely fulfilled by the company. The State and other authorities have accepted the bridges and highways, and the treasurer of the county of Barnstable has returned the $25,000 deposited.

Section 15.—All the requirements of this section have been fulfilled. The company, its successors, or assigns, is only responsible for maintenance of highways, including bridges, within the canal location. The only highways within the canal location are the approaches to the two highway bridges and the ferry crossing the canal. All other highways replaced or constructed by the canal company are on land outside the canal location, except part of highway north of canal at station 200 for a distance of 800 feet just inside north location line.

Section 16.—Certain claims have been made under this section on account of alleged damage to fisheries and oyster beds. Many of these claims have been settled. A few remain which are now in process of adjustment or litigation. Provision has been made by the Cape Cod Construction Co. for final settlement of all pending claims under this section.

Section 20.—This section refers to the very large amount of work done by the commissioners during the process of construction. The commissioners, and the towns of Bourne and Sandwich, have been paid in full and no further claims can come before the county commissioners to be heard, as all claims for damages have been passed upon by this commission.

Section 21.—All taxes due by the Canal Co. to the towns of Bourne and Sandwich during construction have been paid.

PARAGRAPH (O).

Question 1: "The testimony of coastwise shipping companies using the canal as to time saved by such use; certainty of operation; delays and to what they were due; navigation difficulties encountered, especially those due to restricted width of canal, and the effects of tidal currents, strong winds, fog, and ice."

Attached hereto, marked "Exhibit B,"[1] is the testimony of shipping interests relative to their use of the canal.

PARAGRAPH (P).

Question 1: "What are the reasons for the abandonment of the use of the canal by the Merchants & Miners Steamship Company?"

The situation regarding the Merchants & Miners Steamship Co. is best illustrated by an extract from a letter written by the president of the said Merchants & Miners Steamship Co., dated October 18, 1916, as follows:

"* * * Now about the canal: Most of our captains have made a trip through it and they are almost to a unit in believing that if the canal were wider and deeper it would be well for us to use it northbound, especially in the summer months, when they think we would save two hours, but southbound they see no advantage other than the one that you have referred to—that there is more fog on the shoals than to the westward. We are moving very heavy freights, and I find our ships are drawing more water than I was aware of. I inclose herewith statement, from which you will note that all ships draw over 20 feet aft except the Steamship Grecian. This ship has been running on the Philadelphia-Boston route, which carries only package freight, but we have transferred her to the Baltimore-Boston line, and northbound we will probably put in her 200 to 400 tons of pig iron, which will put her draft, I know, about twenty feet. As you know, there is a decided advantage to the Metropolitan Line using your canal which would not accrue to us. They are enabled to add 25 per cent to her inspection list by not going around the cape. This adds enormously to her earning capacity, for which they can well afford to pay. Our ships only carry about 100 people, and in the summer months we run full. We can not add to our number by going through the canal, and, therefore, the canal would not be of any advantage to us except in the saving of actual operating expense."

From the above it will be seen that the ships of the Merchants & Miners Steamship Co. are of large capacity and deep draft, and while it is believed that the canal offers facilities greatly to the advantage of that company, which could be easily demonstrated through use of the canal, there is submitted without further comment their own deductions as set forth in the above excerpt. This office believes, however, that in

[1] Not printed.

due course of time the proverbial prejudice of seafaring men against any change in established routes will be overcome.

Question 2: "What are the reasons for the abandonment of the use of the canal by the New England Coal & Coke Co.?"

As in the case of the Merchants & Miners Steamship Co., this office is not aware of any abandonment of use of the canal by the New England Coal & Coke Co. The bulk of the New England Coal & Coke Co.'s freight is carried in steamers having a draft of over 25 feet. Certain of their shipments were made in smaller barges or "boxes" belonging to affiliated companies, and these have and are using the canal. Under date of April 24, 1916, Mr. Edward Page, vice-president of the Boston Tow Boat Co., wrote as follows: "I think our people have used and are trying to use the canal all they possibly can."

Attached hereto and marked "Exhibit C"[1] are two letters, one from the Merchants & Miners Transportation Co., and one from the New England Fuel & Transportation Co., relative to the use of the Cape Cod Canal. A copy[1] of the questions to which the above is in reply is also attached hereto.

(Above information furnished by the Boston, Cape Cod & New York Canal Co.)

LETTER OF BRIG. GEN. WM. T. ROSSELL.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE, NORTHEAST DIVISION,
New York, N. Y., November 22, 1917.

MY DEAR SHUNK: There is inclosed, herewith, photostat copy of a letter from the Secretary of Commerce to the Secretary of War, relative to the Cape Cod Canal, in which he desires to have certain information incorporated in the report of survey.

I wish you would go over carefully the contents of the inclosed copy of letter from the Secretary of Commerce, and any suggestions you may have to offer, or any information you can give me with regard to the questions asked by him, will be gladly received.

Very sincerely,

WM. T. ROSSELL,
Brigadier General, United States Army, Retired.

Col. FRANCIS R. SHUNK,
Corps of Engineers.

[1st indorsement.]

UNITED STATES ENGINEER OFFICE,
Boston, Mass., May 13, 1918.

The DIVISION ENGINEER, NORTHEAST DIVISION,
New York, N. Y.

1. Returned.

2. In the letter referred to, the Secretary of Commerce propounds 22 problems. I am able to give information of some value bearing upon a few of them.

3. Letters have been sent to owners of all vessels supposed to be engaged in traffic around Cape Cod or through the canal. Twenty-five replies have been received as follows:

OPERATING LARGE POWER VESSELS ONLY.

1. A. H. Bull Co., 17 Battery Place, New York: Two steamers 335 feet long, 46 feet wide, 21 feet 6 inches draft; annual traffic 150,000 tons coal and 30,000 tons phosphate rock.

---

[1] Not printed.

2. Clyde Steamship Co., Pier 36, North River, New York: No particulars of tonnage.

3. Cuba Distilling Co., 40 Exchange Place, New York: Steamers 400 feet long, 54 feet wide, 27 feet draft; 5 or 6 and sometimes 12 trips annually between Boston and New York. No statement of traffic.

4. Eastern Steamship Corporation, India Wharf, Boston. Metropolitan Line to New York: Four freight steamers, 278 feet long, 43 feet wide. 22-foot draft, and two freight and passenger steamers, Massachusetts and Bunker Hill, 375 feet long, 62 feet wide. 17-foot draft. Maine Steamship Line to Portland: Two freight and passenger steamers 304 feet long, 47 feet wide. Aggregate annual traffic 952,000 tons.

5. Ocean Steamship Co. of Savannah, Pier 35, North River, New York: Four steamers from 2,680 to 3,648 tons; aggregate annual traffic 223,820 tons.

6. United Fruit Co., 131 State Street, Boston: Steamers from 1,000 to 5,000 tons; aggregate annual traffic 240,245 tons.

7. White Oak Transportation Co., 70 Kilby Street, Boston: Two steamers, 2,300 and 2,600 tons; aggregate annual traffic 175,000 tons.

8. Merchants' & Miners' Transportation Co., Baltimore, Md.: Steamers 282 to 333 feet long, 40 to 42 feet wide; annual gross ship tonnage 1,423,136 tons. This letter was withdrawn later, and its contents are not used herein, elsewhere than in total aggregate annual tonnage.

OPERATING LARGE POWER VESSELS, TUGS AND BARGES.

9. Coastwise Transportation Co., 40 Central Street, Boston: Fourteen steamers, 3,000 to 7,500 tons; largest draft, 26½ feet; smallest, 20 feet; 13 barges. average about 1,800 tons each; and 4 tugs; aggregate annual traffic. 3,250,000 tons. This is a coal-carrying line. For this discussion, the barge traffic has been assumed at 300,000 tons.

10. J. B. King Transportation Co., 17 State Street, New York: One motor freight vessel, 115 feet long, 30 feet wide, 12½ feet draft; 9 barges, 117 feet 9 inches to 257 feet long, 35 feet 3 inches to 45 feet wide, 14 to 22 feet 10 inches draft; 2 tugs; aggregate annual traffic 175,000 to 200,000 tons. Two hundred thousand tons has been adopted in this discussion, and all included as barge traffic.

11. New England Fuel & Transportation Co., 111 Devonshire Street, Boston: Five steamers, 244 to 400 feet long, 43.2 to 52.7 feet wide, 20 to 25 feet draft, 3,000 to 7,250 tons cargo capacity; 14 barges 168.9 to 243 feet long, 32 to 41 feet wide, 14 to 18.6 feet draft, 1,000 to 2,400 tons cargo capacity; aggregate annual traffic 1,852,062 tons.

12. Rockport Granite Co., Rockport, Mass.: One steamer, 115 feet long, 27.5 feet wide, 13 feet draft, 350 tons; 3 barges and 2 schooners, 91 to 100.5 feet long, 26.1 to 32.2 feet wide, 8 feet 4 inches to 10 feet 6 inches draft, 200 to 350 tons cargo capacity. Annual traffic not stated, but, based on knowledge of the company's business, is assumed at 10,000 tons.

13. Standard Transportation Co., 26 Broadway, New York: Nine steamers, 260 to 342 feet long, 42 to 46 feet wide, 20 to 23 feet 9 inches draft, 2,500 to 4,800 tons cargo capacity; 18 barges, 185 to 374 feet long, 35 to 50 feet beam, 14 to 24 feet 9 inches draft, 1,500 to 6,800 tons cargo capacity; 6 tugs; aggregate annual traffic 321,725 tons.

OPERATING TUGS AND BARGES ONLY.

14. James Hughes, jr., No. 1 Broadway, New York: Scow barges 800 to 1, 200 tons, 12 feet draft; tonnage, 5,000 to 60,000 tons per month; aggregate annual traffic assumed to be 390,000 tons.

15. Lehigh Valley Railroad Co., Jersey City, N. J.: Four tugs and 26 barges, the largest 1,650 tons. 19 feet draft; aggregate annual traffic 600,000 tons.

16. Lehigh & Wilkesbarre Coal Co., 143 Liberty Building, New York: Three tugs and 15 barges, 135 to 258 feet long, 35 to 50 feet wide, 16 to 22 feet draft, 1,050 to 2,250 tons capacity; aggregate annual traffic 325, 000 tons.

17. F. W. Munn, 645 Drexel Building, Philadelphia, Pa.: Four tugs and 12 barges 176 to 275 feet long, 35 to 45 feet wide, 14.5 to 21 feet draft, 1,200 to 3,400 tons capacity; aggregate annual traffic, 350,000 tons.

18. Northern Transportation Co., 40 Central Street, Boston: Five barges, 900 to 3,000 tons; aggregate annual traffic, 65,000 tons.

19. Pettino Bros., 305 North Fifteenth Street, Philadelphia, Pa.: Two tugs and 4 barges of 800 tons capacity; aggregate annual traffic, 35,000 tons.

20. Potter Transportation Co., 11 Broadway, New York: Barges ranging from 800 to 3,000 tons; aggregate annual traffic, 300,000 tons.

21. Reading Co., Reading Terminal, Philadelphia, Pa.: Nine tugs and 67 barges, 174 to 264 feet 10 inches long, 35 to 43 feet wide, 13 feet 6 inches to 20 feet draft, 1,025 to 2,900 tons capacity; aggregate annual traffic, 1,698,000 tons.

22. Staples Transportation Co., 404 Davol Street, Fall River, Mass.: Eighteen barges, 800 to 3,600 tons capacity; aggregate annual traffic, 48,000 tons.

OPERATING TUGS ONLY.

23. Cahill Towing Line, 140 Broad Street, New York: Six ocean-going tugs.
24. Moran Towing & Transportation Co., 17 Battery Place, New York: Seven tugs.

OPERATING SAILING VESSELS.

25. E. P. Boggs Co., 31 Commercial Street, Boston: Two schooners around Cape Cod; aggregate annual traffic, 10,000 tons.

4. The total annual traffic reported in these letters is 12,648,988 tons of freight actually carried. The tonnage capacity of the vessels is probably considerably larger than this since much of the traffic is one-way. I estimate as one-way traffic 4,499,725 tons carried by barge lines, 2,950,000 tons coal carried by steamers of the Coastwise Transportation Co., and 1,497,062 tons coal carried by steamers of the New England Fuel & Transportation Co. The aggregate of this tonnage is 9,444,887 tons, and I suppose that an equal tonnage capacity of empty vessels goes the other way. This, added to the freight carried, indicates a total tonnage capacity of 22,093,775 tons. This estimate is presumably somewhat inaccurate, but I believe is none too large since the Clyde Co. and the Cuba Distilling Co. gave no figures and other persons written to did not answer.

5. Mr. William Barclay Parsons, in his paper published in the Proceedings of the American Society of Civil Engineers, Volume XLIII, No. 6, page 1031, states "It is estimated that 22,000,000 tons of freight are carried annually around the cape." I do not believe there is this much freight carried. His figure agrees closely with my estimate of carrying capacity of vessels.

6. Of the replies received, seven are from companies operating large steamers only, five from companies operating large steamers, tugs, and barges, nine from companies operating tugs and barges or barges only, two operating tugs only, and one from a company operating schooners.

7. Of the seven companies operating steamer lines, six do not use the canal at all and one (Eastern Steamship Corporation) uses it for two only of its eight steamers; these are the fast steamers Massachusetts and Bunker Hill, which run daily with passengers and light freight between Boston and New York. They are given right of way over all other traffic in the passage through the canal.

8. The reasons given by these companies for not using the canal are as follows: That the approach in Cape Cod Bay is dangerous in foggy weather, that the currents render navigation dangerous, that the tolls are too high, that there are delays in transit through the canal, and that the risk of navigation is increased by deficiency in width and depth.

9. If the canal with its present dimensions were maintained by the United States free of tolls, one steamer line states that it would use it to the greatest extent practicable; one would use it for all its steamers, about 16 passages per week; one would probably use it at times; one is doubtful on account of risk; and three would not use it at all.

10. Of the five lines operating steamers and also tugs and barges, three companies operating altogether 28 steamers state that their

vessels do not use the canal and would not use it with its present dimensions even if it were free of tolls. Their reasons are similar to those given in paragraph 8. One company with one small steamer and one with one small motor freight vessel would continue to use the canal under similar conditions.

11. The companies operating barges, including those operating both steamers and barges, are 14 in number. Their barge fleets comprise 40 tugs and about 200 barges. Of these, four lines with a total of 19 tugs and 91 barges do not use the canal at present and would not use it if maintained at present dimensions free of tolls. One line with 4 tugs and 26 barges does not use it now because of unreasonable requirements as to damages, but would use it most of the time in the winter months and in bad weather in the summer months if it were maintained at present dimensions free of tolls. Four lines with 9 tugs and 37 barges use the canal occasionally for their smaller barges or for a single tug with light tow and would continue to use it to that extent if it were maintained at present dimensions free of tolls. Five lines usually run through the canal. Of these one line with 6 tugs and 18 barges uses the canal for 3 tugs and its smaller barges, 9 in number, up to 268 feet long and 20 feet 9 inches draft. One line with 18 barges uses it for 5 of its smaller barges up to 189 feet long. One line not giving its total number of barges uses the canal for its barges up to 210 feet long, 2,000 tons capacity. One line with 2 tugs and 4 barges of 800 tons uses the canal on every trip, and one line owning scow barges which could not go around the cape uses the canal to a variable extent ranging from 5,000 to 60,000 tons per month.

12. The reasons given for not using the canal reduce really to three; namely, delays in passage, insufficient width and depth, and hazards due to currents and bridges.

13. I think it is shown by the statements given that the canal with its present dimensions is of not much value to vessels that can make the run around Cape Cod with a fair degree of regularity, nor is it much better for the towed-barge traffic, which aggregates about 5,000,000 tons. About 63 per cent of this tonnage can not use the canal at present and about 51 per cent would not use it if it were maintained with its present dimensions free of tolls. About 15 per cent of the towed-barge traffic uses the canal only occasionally and would continue to do so only to this extent even if there were no tolls. Only 22 per cent of the towed-barge traffic habitually uses the canal. One towing company states that its 6 ocean-going tugs use the canal at every opportunity and another states that 3 of its 7 tugs use the canal whenever they can and average about 6 passages. One firm of wholesale grocers states that it operates 4 schooners of about 800 tons capacity each, 2 of which use the canal in the spring and autumn. These schooners would probably use it most of the time if it were free of tolls.

14. As bearing upon the question of reduction in cost to be expected from a free waterway, one company estimates that there will be a reduction of 5 cents to 10 cents per ton on freight; another estimates a reduction of 8 cents to 10 cents. Two expect a reduction of 10 cents per ton; one steamship company estimates a saving to it of $75,000 to $80,000 annually. Another estimates an average

saving of $47 per passage on steamers averaging 3,200 tons, gross tonnage. Seven companies report that a free canal would save expense, time, loss of life, and property; that is to say, that it would reduce cost of transportation and insurance. One steamship company states that the outside route will cost less than the canal and 10 companies do not answer the question.

15. Seven replies are in favor of a lock, 13 are opposed, and 4 do not express an opinion.

16. In reply to the inquiry: "What width and depth are necessary in the canal?" two companies state that the present dimensions are adequate; seven desire a width of 200 feet; two of these would wish 35 feet depth, two 30 feet, two 25 feet, and one does not specify depth. One company asks a width of 250 feet and a depth of 30 feet. Two desire a width of 300 feet, one wishing a depth of 30 feet, the other 35 feet. One company thinks that the width should be 350 feet and the depth 25 feet; two would be satisfied with a width of 500 feet and a depth of 35 feet. One wishes a top width of 300 feet and a depth of 23 feet; one desires depth enough for 10,000-ton ships. Seven companies answer to no purpose or not at all.

17. Nineteen of the 25 firms which made answer to our letters give no explicit opinion of the value to maritime commerce of a free waterway through Cape Cod. President Calvin Austin, of the Eastern Steamship Corporation, speaks unfavorably of the canal in its present condition, but thinks that if widened and deepened and operated by the United States it will be of value. James Hughes, jr., operating a line of scow barges through the canal, thinks that a free canal will be of great value to commerce. The traffic of his company north of Cape Cod has developed as a direct consequence of the opening of the canal, as his barges are not suited for the trip around the cape. F. W. Munn expresses the opinion that with certain increases in width and depth, a double lock at each end and a larger breakwater at the eastern end, the canal would be of great benefit to navigation. The Staples Transportation Co. think that the canal widened and deepened would be advantageous to New England, and the White Oak Transportation Co. think that such canal would be of great practical benefit to commerce. The captains of the Ocean Steamship Co. think that the difficulty of approach to the canal and the risk of navigation in it would offset its advantages.

18. On the whole, I do not think that the canal can be considered a success nor do I believe that with its present dimensions it will be of great benefit to commerce. Its acquisition by the United States will probably entail great expense for enlargement and protection, and also for maintenance unless it be deemed more economical to provide locks.

FRANCIS R. SHUNK,
Colonel, Corps of Engineers.

[Second indorsement.]

OFFICE DIVISION ENGINEER, NORTHEAST DIVISION,
New York City, May 14, 1918.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

The above information was received too late for incorporation in the report on survey of the Cape Cod Canal by this office, and is

forwarded herewith in connection with said report now before the Board of Engineers for Rivers and Harbors for whatever action the board may deem advisable or desirable.

WM. T. ROSSELL,
Brigadier General, United States Army, retired.

LETTER OF THE SECRETARY OF COMMERCE.

DEPARTMENT OF COMMERCE,
Washington, November 13, 1917.

To: The Secretary of War.

Subject: Data and evidence desired by the Secretary of Commerce to be incorporated in the report of the survey of the Cape Cod Canal under section 4 of the act approved August 8, 1917.

References:

(A) Department of Commerce letter,[1] October 6, 1917.
(B) War Department letter,[1] October 18, 1917.
(C) War Department letter,[1] August 23, 1917.
(D) Navy Department letter to Secretary of War, September 21, 1917.
(E) Two inclosures herewith.[1]

Referring to above-noted correspondence and to the law mentioned, the Department of Commerce will be pleased to have the following information incorporated in the report of the survey in order that the department may as fully as possible understand the past, present, and future conditions concerning the Cape Cod Canal, the waters adjacent thereto, and the commerce in connection therewith in order to reach a proper appreciation of the wisdom of acquiring the canal on the part of the Government and the price that should be paid for same:

(1) The gross earnings of the said canal by quarterly periods since its opening in such form as to show whether there is or is not a growth in such earnings, and the apparent average rate of such growth if it shall be found to exist.

(2) The maintenance cost of the said canal by quarterly periods. This to show whether the cost of maintenance increases not only with the passage of time but with the increase, if any, of traffic. It is deemed important also to show the proportionate increase of gross earnings, if any, compared with the increase or decrease of maintenance cost.

(3) Whether it is or is not the fact that the minimum depths of water in the canal are found at definite and separate localities while in other portions of the canal the charter depth of 25 feet at mean low water exists. In other words, a survey of depths should be made throughout the length of the canal to indicate whether shoaling, if any, occurs throughout or only at separate spots, and to what extent, and why.

(4) The additional earning power of the canal, if increased in minimum depth to 35 feet and to 40 feet, based upon existing vessels which in normal times navigate the adjacent waters. To explain, it is said to be the fact that 10 deep-draft colliers would regularly use the canal if it were deepened which because of their present draft—said to be 28 feet—are excluded therefrom.

(5) The relative amount of fog at canal terminals and on the canal as compared with the amount of fog on the shoals or outside of Cape Cod. It is not sufficient to show the percentage of fog at the canal itself. It is the comparison between this amount of fog and that existing in the waters which must otherwise be used that is essential.

(6) The loss of time now incurred by vessels and tows through delays while waiting for favorable weather to round the cape. This applies not merely to fog, but to adverse winds in the case of sailing vessels and to rough water.

---

[1] Not printed.

(7) The loss of life and property that has actually occurred in the last 40 years from wrecks on the eastern and southern shores of Cape Cod, including the sounds between Nantucket Island and the mainland.

(8) The saving in the event of Government ownership that would accrue from the shortened run and the lessened risk (if it shall be shown to exist) to Government vessels other than naval vessels, to wit, vessels of the Coast Guard of the Treasury Department, the Coast and Geodetic Survey, the Lighthouse Service, the Fisheries Service, the Navigation Service of the Commerce Department, vessels of the War Department, and others.

(9) The amount and character of the traffic at present using the canal or which may reasonably be expected to do so in the future. This includes a statement of the relative amount of traffic now passing through Pollock Rip as compared with that passing through the canal.

(10) The effect upon marine insurance, if any, of the operation under Government auspices of the canal if deepened to 35 feet, with a corresponding increase in width and with due provision for passing.

(11) The extent to which additional aids to navigation, lights, and buoys, if any, would be required in excess of the present equipment if the canal were purchased and operated by the Government.

(12) The difference in conditions which exist, if any, between the Cape Cod Canal and the Suez Canal to determine whether the experience of the latter throws light upon the maintenance and operation of the former, and if so, how and to what extent. Included in this is the determination of the geologic structures through which the Cape Cod Canal passes, their susceptibility to change due to erosion, currents, and other natural forces, and the nature and cost of maintenance of improvements necessary to insure permanency of present or future project dimensions.

(13) The meteorological conditions, including the prevalence of storms, their effect upon shipping in passing through the canal or waiting for an opportunity to do so. This should be stated comparatively with the area of waters east and south of Cape Cod to determine relative conditions and should also have particular reference to the possible need of a harbor of refuge near the north end of the Cape Cod Canal.

(14) Tidal currents: These should be studied not merely in their relation to maintenance and to their effects upon traffic, and not merely to their existence in and through the canal, but in the waters at the respective entrances and, if necessary, with a view to their control. This subject also should be comparatively stated in order that the conditions respecting tidal currents may be known, not only with immediate relation to the canal and its entrances but with comparative relation to the tidal currents in and near Pollock Rip and on the eastern coast of Cape Cod. It is not sufficient to know what the local tidal conditions are at the canal itself. There should be added knowledge of whether these conditions are greater or less, better or worse than similar conditions in waters through which ships must pass if they do not use the canal.

(15) The effect upon the food supply, if any, already caused by the opening of the canal and whether same would be enhanced or diminished by the deepening and enlargement thereof, or by the creation of a harbor of refuge at the north end. Under this heading should be determined whether there was any food fishery at either end of the canal before same was opened; whether such a food fishery has come into existence and to what extent since the opening of the canal and by reason of the facilities afforded by it.

(16) The presence or absence of harbors on the south shore of Massachusetts Bay from a point commencing approximately at Plymouth, thence around the north shore of Cape Cod to its end, and the advantage to fisheries, to shipping, and to commerce of the creation of a harbor on this coast, same being available both from the north and from the south (through the canal).

(17) The effect upon industries in the towns in the area adjacent to the south shore of Massachusetts Bay by reason of the ready means of transit to New York City afforded by the canal. This should be comparatively stated to show what means of transportation to New York these towns formerly had and the advantages, if any, given to them by the canal, or which would accrue by its deepening, widening, and by the provision of a harbor at its northern end with dock facilities. For example, would this permit either the stoppage of steamers en route from Boston to New York to pick up passengers and freight or would it permit the establishment of a line of steamers of suitable size and capacity connecting these bay towns with New York?

(18) Are or are not the foundations of the bridges spanning the canal already made to suit a possible future depth of 35 feet of water in the canal?

(19) To what extent does the Canal Co. own land adjacent thereto along the navigable portion of the former Monument River, and what protection exists by reason of such ownership of land as there may be against claims for free navigation, wharfage rights, or other demands arising from alleged riparian rights in that former river?

(20) What would be the present cost of constructing the canal as it stands as compared with the actual price paid for its construction?

(21) What would be the annual saving to our maritime interests if all the tonnage at present rounding the cape used the canal, assuming it to be deepened to 35 feet and correspondingly widened with proper provision for passing?

(22) What is the tonnage of coal now shipped around Cape Cod annually, and what loss is there per ton and in total arising from delays by reason of weather conditions of all kinds, and loss from wrecks? In this connection it should be learned whether in addition to saving such loss there would be further gain from making more trips per annum by reason of reduced distance and greater mobility, or by the substitution of less powerful tugs from the southern entrance of the canal to Boston for the large ocen-going tugs used outside Cape Cod.

There is attached hereto a statement [1] (marked A) furnished by the Coast and Geodetic Survey of the distances from the Battery, New York, to President Roads, Boston, by the various available routes.

There is also attached copy of Coast and Geodetic Survey chart [1] No. 7 (marked B) on which are shown in red the track through the Cape Cod Canal and the various tracks around Cape Cod for vessels of different drafts. The tracks shown are those commonly used by vessels plying between New York and Boston.

Herewith also is letter [1] (marked C) from John W. Dalton, Sandwich, Mass., dated September 22, 1917, furnished at my request.

In this letter I have omitted a number of points which seem fully covered by the letter of the Secretary of the Navy, dated September 21, 1917.

Yours, very truly,

WILLIAM C. REDFIELD, *Secretary.*

[Second indorsement.]

OFFICE CHIEF OF ENGINEERS,
November 19, 1917.

To The DIVISION ENGINEER, NORTHEAST DIVISION,
New York City:

For his information and guidance in connection with the investigation he is making of this subject.

By command of the Chief of Engineers:

H. C. NEWCOMER,
Colonel, Corps of Engineers.

[Third indorsement.]

OFFICE DIVISION ENGINEER, NORTHEAST DIVISION,
New York City, April 4, 1918.

To The CHIEF OF ENGINEERS, UNITED STATES ARMY:

Returned, inviting attention to report of this date on survey of the Cape Cod Canal, accompanying which, and marked "Exhibit C," are the answers to the above questions asked by the Secretary of Commerce.

WM. T. ROSSELL,
Brigadier General, United States Army, Retired.

[1] Not printed.

Appendix C, Part 1.

ANSWERS TO QUESTIONS ASKED BY THE SECRETARY OF COMMERCE IN HIS LETTER DATED NOVEMBER 13, 1917, TO THE SECRETARY OF WAR.

Question No. 1. The gross earnings of the said canal by quarterly periods since its opening in such form as to show whether there is or is not a growth in such earnings, and the apparent average rate of such growth if it shall be found to exist.

Answer: See Exhibits F and FF in report of Price, Waterhouse & Co., dated January 5, 1918, accompanying report on survey of the Cape Cod Canal, and marked Appendix A. In addition to the comparative earnings the figures of tonnage are given. As the rates of toll were changed at various times the tonnage figures show a truer comparison of the increase or decrease of traffic as a common basis was possible for the entire period.

Question No. 2: The maintenance cost of the said canal by quarterly periods. This to show whether the cost of maintenance increases not only with the passage of time but with the increase, if any, of traffic. It is deemed important also to show the proportionate increase of gross earnings, if any, compared with the increase or decrease of maintenance cost.

Answer: See Exhibits F and FF in report of Price, Waterhouse & Co., dated January 5, 1918, accompanying report on survey of the Cape Cod Canal and marked Appendix A. During the maintenance period the contractor was also continuing construction work, and where no maintenance is shown the work was being done by the contractors and paid for by them during that period.

Question No. 3: Whether it is or is not the fact that the minimum depths of water in the canal are found at definite and separate localities while in other portions of the canal the charter depth of 25 feet at mean low water exists. In other words, a survey of depths should be made throughout the length of the canal to indicate whether shoaling, if any, occurs throughout or only at separate spots, and to what extent and why.

Answer: Surveys since the opening of the canal have developed the fact that shoaling occurs at six distinct localities:

One at the eastern end, where the canal prism increases in width from 100 to 200 feet.

One at the western entrance to the Sagamore Bridge, where the canal has been widened for the 160-foot span.

One at the western end of the canal, where the narrow section joins the 250-foot approach channel.

The other three places are at stations 52, 203, and 295, and in each case this shoaling comes where the canal widens in width. From the above-mentioned map it will be seen that 90 per cent of the prism has a depth of from 25 to 30 feet, the remaining 10 per cent being divided into the shoals above mentioned, and a few scattering spots insignificant in area and with sufficient water over them as not to interfere with navigation.

DETAILS OF THE SHOALS MENTIONED ABOVE.

The shoal at the eastern end extends from stations 50 to 70, and consists of sand and silt from the erosion of the banks and scour from the bottom to the narrower section of the canal to the westward. In the last year this section has shoaled about 2 feet. The material is of such a nature that it can be easily removed by hydraulic dredging, ample spoil area being available. It has been found necessary to remove only 50,000 cubic yards of material from this locality within the last two years.

The shoal at Sagamore Bridge. The canal prism is widened at the Sagamore Bridge to allow for the 160-foot span, and to the west of the bridge the shoal forms from station 116 to 120 the width of the shoal being about 120 feet. The shoal consists of fine sand and silt and can be removed easily, if it forms again, by hydraulic dredging. Sufficient spoil area exists on the south bank. During the last two years 30,000 cubic yards of material have been removed from this locality.

The shoal at the western end. Conditions at the western end are similar to those found at the eastern end, and the shoal consists of sand and silt from the erosion of the banks and scour from the bottom of the narrower section of the canal. The shoal extends from station 400 to 410, which is just west of the point where the 100-foot canal joins the 250-foot approach channel. This material can also be removed by hydraulic dredging. During the past two years 38,000 cubic yards have been removed.

Question No. 4: The additional earning power of the canal, if increased in minimum depths to 35 feet and to 40 feet, based upon existing vessels which in normal times navigate the adjacent waters. To explain, it is said to be the fact that 10 deep draft colliers would regularly use the canal if it were deepened which, because of the present draft, said to be 28 feet, are excluded therefrom.

Answer: The additional earning power of the canal, if it were deepened to 35 or 40 feet, and widened an additional 100 feet, would be that all of the traffic which now goes around the Cape would undoubtedly use the canal. The additional depth and width would allow vessels to pass each other in the canal, and there would be no necessity of breaking up tows by the tug taking one or two loaded barges at a time as at present, thus insuring a continuous haul and consequent saving of time.

The following estimated minimum income, based upon present toll rates, would result, if the canal were widened and deepened, assuming all vessels now going around Cape Cod would use the canal:

15,000,000 tons of crude material, at 5 cents per cargo ton	$750,000
5,000,000 tons of empty vessels, at 3 cents per gross ton	150,000
5,000,000 tons of passenger and freight steamers, at 8 cents per gross ton	400,000
80,000 tons of yachts and motor boats, at 8 cents per gross ton	6,400
70,000 tons of Government vessels, at 8 cents per gross or displacement ton	5,600
	1,312,000

an income of $109,333 per month, or $3,644.44 per day. It is to be noted that coal and other crude material amount to 15,000,000 tons, but that it is generally one-way freight and the vessels carrying crude material return empty.

The total receipts from tolls shown above are a minimum and are based on the lowest toll rate, whereas the toll rates for the various classifications are on a sliding scale, and many vessels pay tolls under the sliding scale basis which makes the toll rate per ton much more than the minimum used in the above compilation. The number of vessels going through the canal from October 1, 1916, to September 30, 1917, amounted to 3,551, and for tolls paid, see copies of present toll rates, marked Exhibit AA.

In normal times there are approximately 25,000 vessels rounding Cape Cod per annum. If they should all use the deepened and widened canal there would be approximately a vessel in the canal every 20 minutes throughout the year.

About the outbreak of the war there were five colliers drawing when loaded between 26 and 28 feet, namely, Middlesex, Melrose, Malden, Everett, and Newton, owned by the New England Coal & Coke Co. Five other colliers were building for service on the Atlantic coast in the New England trade.

On December 31, 1917, Railroad Director McAdoo issued an order that 2,000,000 tons of coal are to be shipped into New England per month by water and 1,000,000 tons a month by rail. The Shipping Board withdrew two vessels in the nitrate trade and three vessels from the Belgian relief to put in this service. It is respectfully pointed out that by using the Cape Cod Canal these five vessels can make two and one-half round trips more per year between Norfolk and Boston than if they went outside the cape.

Question No. 5: The relative amount of fog at canal terminals and on the canal as compared with the amount of fog on the shoals or outside of Cape Cod. It is not sufficient to show the percentage of fog at the canal itself. It is the comparison between this amount of fog and that existing in the waters which must otherwise be used that is essential.

Answer: Exhibit A attached was compiled from the records of the Lighthouse Department. Attached to this exhibit is a white print[1] showing the location of the four light stations (underlined in red) mentioned in the exhibit.

Exhibit A shows that the average fog hours for the years from 1909 to 1916, inclusive, at Bird Island and Wings Neck, Buzzards Bay, located at the end of the approach channel was as follows:

Bird Island:

Number of fog hours, 3,049¾.

Average, 1909 to 1916, inclusive, 8 years, 381 hours.

Wings Neck:

Number of fog hours, 3,847¼.

Average, 1909 to 1916, inclusive, 8 years, 480 hours.

Fog hours at the Gurnet, which is 16 miles north of the canal on Cape Cod Bay shows as follows:

Number of fog hours, 5,321½.

Average, 1909 to 1916, inclusive, 8 years, 665 hours.

Fog hours at Pollock Rip Light Vessel, which is at the elbow of the cape, shows as follows:

[1] Not printed.

Number of fog hours, 8,694.

Average, 1909 to 1916, inclusive, 8 years, 1,086 hours.

The above shows the marked difference of the period of fog at the canal compared with Pollock Rip. This is explained by the intervening land which dissipates the fog. It is also of great importance that the sea fog in the canal is negligible as compared with the sea fog in Buzzards Bay and at Pollock Rip.

The steamers Bunker Hill and Massachusetts were able to navigate in the canal during all conditions of tide and atmosphere the past two summers without any noticeable delay.

There is also attached hereto, marked Exhibit C, fog record for each month for the years 1910 to 1916, inclusive, for the Cape Cod Canal and the vicinity. This information was obtained from the Commissioner of Lighthouses, Department of Commerce, Washington, D. C.

EXHIBIT A.

Statement showing number of days and hours of fog for years 1909 to 1916, inclusive, at Pollock Rip Light Vessel, Wings Neck Light Station, Bird Island Light Station, and Plymouth (Gurnet Light Station).

Year.	Pollock Rip Light Vessel.		Wings Neck Light Station.		Bird Island Light Station.		Plymouth (Gurnet Light Station).	
	Days.	Hours.	Days.	Hours.	Days.	Hours.	Days.	Hours.
1909	117	843	46	219	35	148	59	281
1910	132	1,204	74	423	10	112	103	635
1911	136	1,198	85	641	17	122	105	775
1912	.....	1,037	.....	473¼	.....	360	.....	649
1913	.....	1,048¾	.....	539	.....	641¾	.....	788½
1914	109	812	55	391	75	490	122	771
1915	114	1,082	87	513	91	521	98	580
1916	155	1,470	103	648	97	655	132	842
Total	763	8,694¾	450	3,847¼	325	3,049¾	619	5,321½
Average	127	1,096	75	480	54	381	103	665

Average percentage of fog hours at Pollock Rip Light Vessel over Wings Neck Light Station, 126 per cent.

Average percentage of fog hours at Pollock Rip Light Vessel over Bird Island Light Station, 185 per cent.

Average percentage of fog hours at Pollock Rip Light Vessel over Plymouth (Gurnet Light Station), 63 per cent.

Average duration of fog: Pollock Rip Light Vessel, 8¼ hours; Wings Neck Light Station, 6½ hours; Bird Island Light Station, 7 hours; Plymouth (Gurnet Light Station), 6½ hours.

Fog record.

Year.	Hours of fog at—		
	Wings Neck Light Station.	Bird Island Light Station.	Plymouth Light Station.
1910[1]	423	112	635
1911[1]	641	122	775
1912.			
January	21	19	116
February	(2)	(2)	18
March	74	62	99
April	43	22	68
May	98	51	131
June	40	20	1
July	89	44	52
August	17	10	61
September	8	5	9
October	6	11	13
November	13	34	32
December	64	82	49
Total	473	360	649

[1] Only records available are totals for the year.

[2] No record kept; bell not sounded.

Fog record—Continued.

Year.	Hours of fog at—		
	Wings Neck Light Station.	Bird Island Light Station.	Plymouth Light Station.
1913.			
January	85	104	55
February	55	55	57
March	127	132	111
April	38	38	110
May	57	70	65
June	51	53	25
July	12	21	39
August	7	17	49
September	8	19	61
October	81	93	185
November	19	17	18
December	8	23	13
Total	539	642	788
1914.			
January	26	76	70
February	26	59	97
March	48	62	100
April	16	19	65
May	16	24	76
June	7	12	16
July	85	83	109
August	76	47	95
September	10	11	3
October	28	31	42
November	4	11	21
December	59	55	77
Total	391	490	771
1915.			
January	82	91	61
February	24	33	66
March	.....	3	2
April	71	52	72
May	37	27	10
June	77	99	129
July	53	59	99
August	28	16	73
September	62	46	22
October	30	40	11
November	13	14	11
December	31	41	24
Total	513	521	580
1916.			
January	56	70	27
February	108	94	113
March	100	64	116
April	19	23	42
May	68	72	89
June	62	54	101
July	74	98	112
August	35	43	99
September	34	44	59
October	33	38	40
November	6	9	9
December	53	46	35
Total	648	655	842

EXHIBIT AA.

TOLL RATES, CAPE COD CANAL.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
NEW YORK, *September 8, 1916.*

[Special notice superseding all previous notices relative to toll rates for vessels of "Class A."]

The following toll rates, subject at all times to change or cancellation without notice, are effective this date.

Tolls for yachts, motor boats, and vessels not engaged in commercial trade.

	Per single passage.	Making a single passage through canal in squadrons of 10 or more vessels per single passage.
FOR VESSELS LESS THAN 16 GROSS TONS BASED ON LENGTH OVER ALL.		
Minimum less than 30 feet	$5.00	$4.00
30 feet to 34 feet	6.00	5.00
35 feet to 39 feet	8.00	6.00
40 feet to 44 feet	10.00	7.00
45 feet to 49 feet	12.00	8.00
50 feet to 54 feet	14.00	9.00
55 feet to 59 feet	16.00	10.00
60 feet to 64 feet	18.00	12.00
65 feet and over and less than 16 gross tons	20.00	14.00
FOR VESSELS OVER 16 GROSS TONS.		
16 to 19	21.00	16.00
20 to 24	23.00	18.00
25 to 29	25.00	20.00
30 to 34	27.00	22.00
35 to 39	29.00	24.00
40 to 44	31.00	26.00
45 to 49	33.00	28.00
50 to 74	35.00	30.00
75 to 99	38.00	32.00
100 to 124	41.00	34.00
125 to 149	44.00	36.00
150 to 199	47.00	38.00
200 to 249	50.00	40.00
250 to 299	52.00	42.00
300 to 349	54.00	44.00
350 to 399	56.00	46.00
400 to 449	58.00	48.00
450 to 499	60.00	50.00
500 to 549	62.00	52.00
550 to 599	64.00	54.00
600 to 649	66.00	56.00
650 to 699	68.00	58.00
700 to 749	70.00	60.00
750 to 799	72.00	62.00
800 to 849	74.00	64.00
850 to 899	76.00	66.00
900 to 949	78.00	68.00
950 to 999	80.00	70.00
	[1]	[2]

[1] For vessels over 1,000 gross tons, 8 cents per gross ton per single passage.
[2] For vessels over 1,000 gross tons, 7 cents per gross ton per single passage.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
NEW YORK, *September 8, 1916.*

[Special notice superseding all previous notices relative to toll rates for vessels of "Class B."]

The following toll rates, subject at all times to change or cancellation without notice, and effective this date are not for vessels which have to make a fixed schedule time between ports and which require immediate passage through the canal.

	Tolls for vessels engaged in commercial trade. (Includes passenger vessels and freight vessels carrying other than crude material.) Per single passage.	Tolls for tugs when having no tow, per single passage.
FOR VESSELS LESS THAN 16 GROSS TONS BASED ON LENGTH OVER ALL.		
Minimum less than 30 feet	$5.00	$3.00
30 feet to 34 feet	6.00	3.50
35 feet to 39 feet	8.00	4.00
40 feet to 44 feet	10.00	5.00
45 feet to 49 feet	12.00	6.00
50 feet to 54 feet	14.00	7.00
55 feet to 59 feet	16.00	7.50
60 feet to 64 feet	18.00	8.50
65 feet and over and less than 16 gross tons	20.00	10.50
FOR VESSELS OVER 16 GROSS TONS.		
16 to 19	21.00	10.00
20 to 24	23.00	10.50
25 to 29	25.00	11.00
30 to 34	27.00	11.50
35 to 39	29.00	12.00
40 to 44	31.00	12.50
45 to 49	33.00	13.00
50 to 74	35.00	14.00
75 to 99	38.00	15.00
100 to 124	41.00	16.00
125 to 149	44.00	17.00
150 to 199	47.00	18.00
200 to 249	50.00	19.00
250 to 299	52.00	20.00
300 to 349	54.00	21.00
350 to 399	56.00	22.00
400 to 449	58.00	23.00
450 to 499	60.00	24.00
500 to 549	62.00	.....
550 to 599	64.00	.....
600 to 649	66.00	.....
650 to 699	68.00	.....
700 to 749	70.00	.....
750 to 799	72.00	.....
800 to 849	74.00	.....
850 to 899	76.00	.....
900 to 949	78.00	.....
950 to 999 [1]	80.00	.....

[1] For vessels over 1,000 gross tons, 8 cents per gross ton per single passage.

The toll rates for pile drivers, drill boats, dredges, wrecking outfit, and commercial vessels not licensed to carry passengers or cargo are not included in the above tolls as formerly. Owners of such vessels should apply to the superintendent for rates.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
NEW YORK, *September 8, 1916.*

[Special notice superseding all previous notices relative to toll rates for vessels of class C.]

On and after September 8, 1916, the separate schedule of toll rates including towage for commercial schooners of 100 tons capacity or over, known as class C1, dated November 5, 1915, will be canceled, and the following rates will be effective for all schooners and all other vessels engaged in carrying crude material.

On and after September 8, 1916, the Boston, Cape Cod & New York Canal Co. will not tow vessels through the canal.

A separate organization known as the Cape Towing Corporation has arranged to provide tugs for towing through the canal. All vessels requiring the services of a tug should, from and after September 8, 1916, make their own arrangements with the Cape Towing Corporation or any other towing company.

The towing charge will be in addition to the tolls to be charged by this company.

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

Tolls.	Vessels carrying crude material in bulk cargo lots, for a vessel with cargo per single passage.	Vessels having no cargo, but empty or in ballast per single passage.
FOR VESSELS LESS THAN 16 GROSS TONS BASED ON LENGTH OVER ALL.		
Minimum less than 30 feet	$4.00	$3.00
30 to 39 feet	5.00	4.00
40 to 44 feet	7.00	5.00
45 to 49 feet	8.00	6.00
50 to 59 feet	9.00	8.00
60 and over and less than 16 gross tons	12.00	9.00
FOR VESSELS OVER 16 GROSS TONS		
16 to 24	12.00	9.00
25 to 34	14.00	9.50
35 to 49	18.00	10.00
50 to 74	21.00	10.50
75 to 99	24.00	11.00
100 to 124	27.00	11.50
125 to 149	30.00	12.00
150 to 199	33.00	12.50
200 to 299	37.00	13.00
300 to 399	39.00	14.00
400 to 499	40.00	15.00
	(1)	(2)

[1] Vessels over 500 gross tons will be charged on the basis of their having on board 800 tons of cargo at 5 cents per cargo ton per single passage. Vessels having on board over 800 cargo tons 5 cents per cargo ton single passage.

[2] Vessels over 500 gross tons without cargo 3 cents per gross ton per single passage.

The total tonnage of cargo in vessels in tow is to be computed as if on board a single vessel.

Tolls include the towing tug provided by the owners of barges or schooners.

Vessels carrying cargo by measurement must reduce it to tons.

For information regarding contract rates, etc., apply to—

BOSTON, CAPE COD & NEW YORK CANAL CO.

Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
NEW YORK, *March 26, 1917.*

TOLL RATES FOR COMMERCIAL SCHOONERS AND ALL CRUDE MATERIAL CARGO VESSELS PROPELLED BY THEIR OWN SAIL POWER (CLASS C1).

[Superseding all previous notices relative to toll rates for vessels of class C1.]

The following toll rates through canal are subject at all times to change or cancellation without notice and are effective this date for commercial schooners and sailing vessels propelled by their own sail power carrying crude material and having a cargo capacity of 100 tons or over.

Barges, boxes, and other such vessels do not come under this class.

Tolls for loaded or light schooners and sailing vessels of 100 tons capacity or over carrying crude material in bulk cargo lots, on the carrying capacity of vessel, per single passage.

100 to 149 tons capacity	$16.00	450 to 499 tons capacity	$26.00
150 to 199 tons capacity	17.00	500 to 549 tons capacity	27.00
200 to 249 tons capacity	19.00	550 to 599 tons capacity	29.00
250 to 299 tons capacity	20.00	600 to 699 tons capacity	31.00
300 to 349 tons capacity	21.00	700 to 799 tons capacity	33.00
350 to 399 tons capacity	23.00	800 to 899 tons capacity	37.00
400 to 449 tons capacity	25.00	900 to 999 tons capacity	40.00

Schooners and sailing vessels having a capacity of 1,000 tons or more, 4 cents per cargo ton.

The definition of carrying capacity is the maximum amount of coal that a vessel can carry. Bills of lading must be submitted to toll collectors. A vessel loaded with lumber or other commodity lighter than coal shall pay tolls based on the full coal capacity tonnage.

In all other respects the class C schedule of tolls dated September 8, 1916, for barges, boxes, fishing boats, and other such vessels having a cargo carrying capacity less than 100 tons, to remain in full force and effect.

The rates above are effective only for commercial schooners and sailing vessels propelled by their own sail power carrying crude material and having 100 cargo tons or more on board.

BOSTON, CAPE COD & NEW YORK CANAL CO.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
NEW YORK, *September 19, 1917.*

TOLL RATES FOR VESSELS ENGAGED IN CARRYING FISH AND SHELLFISH WHETHER THE VESSEL IS LOADED OR LIGHT (CLASS C2).

[Superseding all previous notices relative to toll rates for fishing vessels.]

The following toll rates through the canal are subject at all times to change or cancellation without notice and are effective this date for vessels engaged in carrying fish and shellfish whether the vessel is loaded or light.

For vessels less than 16 gross tons based on length over all:		For vessels over 16 gross tons—Contd.	
Minimum less than 30 feet	$5.00	35 to 49 gross tons	$16.00
30 to 39 feet	7.00	50 to 74 gross tons	18.00
40 to 44 feet	8.00	75 to 99 gross tons	21.00
45 to 49 feet	9.00	100 to 124 gross tons	25.00
50 to 59 feet	11.00	125 to 149 gross tons	28.00
60 feet and over and less than 16 gross tons	12.00	150 to 174 gross tons	30.00
		175 to 199 gross tons	32.00
For vessels over 16 gross tons:		200 to 224 gross tons	34.00
16 to 24 gross tons	12.00	225 to 249 gross tons	36.00
25 to 34 gross tons	14.00	250 to 299 gross tons	37.00
		300 to 399 gross tons	38.00
		400 to 499 gross tons	39.00

BOSTON, CAPE COD & NEW YORK CANAL CO.

Capt. H. L. GOLBETH, *Superintendent.*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
NEW YORK, *September 8, 1916.*

[Special notice (superseding all previous notices relative to toll rates for Government vessels).]

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

Class "D" tolls for Government vessels shown in Government books under gross tonnage, and as entered in ship's data book for displacement normal.

For vessels less than 16 gross or displacement tons based on length over all:

Minimum less than 30 feet	$8.00
30 feet to 34 feet	10.00
35 feet to 39 feet	12.00
40 feet to 44 feet	15.00
45 feet to 49 feet	17.00
50 feet to 54 feet	20.00
55 feet to 59 feet	22.00
60 feet to 64 feet	25.00
65 feet and over and less than 16 gross or displacement tons	30.00

For vessels over 16 gross or displacement tons:

16 to 19	$30.00
20 to 24	31.00
25 to 29	32.00
30 to 34	33.00
35 to 39	35.00
40 to 44	37.00
45 to 49	40.00
50 to 74	45.00
75 to 99	50.00
100 to 124	55.00
125 to 149	60.00
150 to 199	65.00
200 to 249	70.00
250 to 299	72.00
300 to 349	74.00
350 to 399	76.00
400 to 449	78.00
450 to 499	80.00
500 to 549	82.00
550 to 599	84.00
600 to 649	86.00
650 to 699	88.00

For vessels over 16 gross or displacement tons—Continued.

700 to 749	$90.00
750 to 799	92.00
800 to 849	94.00
850 to 899	96.00
900 to 949	98.00
950 to 999	100.00
1,000 to 1,049	102.00
1,050 to 1,099	104.00
1,100 to 1,149	106.00
1,150 to 1,199	108.00
1,200 to 1,249	110.00
1,250 to 1,299	112.00
1,300 to 1,349	114.00
1,350 to 1,399	116.00
1,400 to 1,449	118.00
1,450 to 1,499	120.00
1,500 to 1,599	124.00
1,600 to 1,699	128.00
1,700 to 1,799	136.00
1,800 to 1,899	144.00
1,900 to 1,999	152.00
2,000 to 2,099	160.00
2,100 to 2,199	168.00
2,200 to 2,299	176.00
2,300 to 2,399	184.00
2,400 to 2,499	192.00
2,500 to 2,999	200.00
3,000 to 3,999	240.00
4,000 to 4,999	300.00
5,000 to 5,999	360.00
6,000 to 6,999	420.00
7,000 to 7,999	480.00
8,000 to 8,999	540.00
9,000 to 9,999	600.00
10,000 and over, 6 cents per gross or displacement ton.	

Fuel and supply vessels over 1,000 gross or displacement tons when empty or in ballast 5 cents per gross or displacement ton per single passage.

BOSTON, CAPE COD & NEW YORK CANAL CO

Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
CAPE TOWING CORPORATION,
Buzzards Bay, Mass., September 8, 1916.

The following toll and towage rates, subject at all times to change or cancellation without notice, and effective this date, are for vessels of dredging, wrecking, and construction plants:

	Charge of canal company for tolls.	Charge of towing corporati n for towage.
Dredges and drill boats per linear foot of length.	$1.50 per foot	35 cents per foot.
Scows and lighters up to 50 feet in length	$35 each	$15 each
Scows and lighters over 50 feet in length	$35 plus 65 cents per foot for every foot over 50 feet.	$15 plus 35 cents per foot for every foot over 50 feet.
Pile drivers and water boats	$25 each	$15 each.
Pontoons	$10 each	$5 each

Scows and lighters when loaded with crude material will be charged under Class C rates, and when returning empty after a loaded trip, will be charged Class C empty rates.

No toll charge will be made on the tug furnished by the owner of the vesssel or vessels provided such tug tows the vessel or vessels through the canal. If such tug proceeds through the canal without a tow, the regular toll rates for tugs will be charged. When the Cape Towing Corporation's tugs are hired to tow, the above rates will be charged, but if the tug is only used to assist in towing any vessel or vessels, a charge of $10 will be made for each vessel assisted.

BOSTON, CAPE COD & NEW YORK CANAL CO.
CAPE TOWING CORPORATION,

Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

Question No. 6: The loss of time now incurred by vessels and tows through delays while waiting for favorable weather to round the cape. This applies not merely to fog but to adverse winds in the case of sailing vessels and to rough water.

Answer: The personal experience of Capt. H. L. Colbeth, Melrose, Boston, Mass., who has passed around Cape Cod hundreds of times, regarding delays around Cape Cod by fog, adverse winds, and rough water, is that there are only two instances when no vessels were anchored in Vineyard Haven.

The average delay for a tow between October 1 and April 1 was about 3 days per passage, and in the summer months 2 days per passage on account of fog.

Coasting vessels operating between New England, provincial, and Middle Atlantic ports will average for the 12 months of the year 4 or 5 days in Vineyard Haven on every voyage, due to fog and weather conditions.

The schooners will make about 7 round trips per year between eastern Maine ports and New York, and the large coal schooners make 11 or 12 round trips between Philadelphia, Norfolk and Baltimore and Boston, Portsmouth, and Bangor.

On page 47 of the hearing before the Committee on Commerce, United States Senate, Mr. Isaac Buchanan, superintendent of the floating equipment, Lehigh & Wilkesbarre Coal Co., states that "in 1915, before we used the canal, we lost 102 days awaiting favorable weather to go around Cape Cod. All that time we had to lie in Vineyard Haven, awaiting favorable weather. In 1916 we lost 98 days waiting to get around the cape. It takes us, with a tug and 3 barges, to run from New York to Boston 42 hours. Going by way of the Cape Cod Canal we have to run it in 28 hours."

And on page 53, Capt. John H. Purett, president of the National Maritime Association of Masters, Mates, and Pilots, states that "going through the canal almost any pilot would expect to make his trip in 24 hours. To go down over the shoals no man would expect to make it in much less than 36 hours."

Under date of June 22, 1912, Capt. J. M. Cherry, superintendent floating equipment, Lehigh Valley Railroad, states:

"Tugs will average 2 trips per month to points east of Cape Cod, including the delays, and during the winter will average 1½ trips per month. As we operate all the way to the Penobscot River we only checked up the delays to tugs going to and from eastern ports around Cape Cod, and found that in one calendar year we lost 365 days, which is a trifle better than 91 days per tug per year. I feel that this average

was a little high, for the reason that we were towing at that time the smaller barges going east of Cape Cod."

See attached Exhibit D, being an account of delays to vessels October, 1913, and the loss occasioned thereby.

Steamers of the Harper Transportation Co.—Delays on account of fog between Cape Cod and Gay Head:

Steamer L. V. Stoddard, January 1 to April 20, 1913, 6 trips, 90 hours; average delay per trip, 15 hours.

Steamer Penobscot, January 1 to March 11, 1913, 7 trips, 45 hours; average delay per trip, 6 hours and 42 minutes.

Steamer Geo. E. Warren, January 1 to April 30, 1913, 6 trips, 75 hours; average delay per trip, 12 hours and 50 minutes.

Steamer Edison Light, February 1 to May 1, 1913, 5 trips, 111.08 hours; average delay per trip, 22 hours and 13 minutes.

Steamer F. J. Lisman, January 1 to April 15, 1913, 6 trips, 24 hours; average delay per trip, 4 hours.

Steamer Seaconnet, January 1 to April 1, 1913, 6 trips, 30 hours; average delay per trip, 5 hours.

There is attached and marked "Exhibit E," a statement showing the true wind velocities of more than 40 miles per hour at the Cape Cod Canal for the years 1908 to December, 1915, with wind roses attached.

The prevailing winds at the canal are northeast and southwest. They blow across the canal, and produce no direct effect.

Exhibit D.

[Chapter V.—The Belmont Canal—Its characteristics—Climate—Weather—Engineering features.]

The canal runs through the 8-mile shoulder of what Thoreau called "The bare, bended arm of Massachusetts." The locality, according to Prof. Shaler, is one of the most interesting moraine formations of America, and was formed by two glaciers meeting and depositing a ridge 29 feet high halfway between two pools now known as Cape Cod and Buzzards Bays. Over this wall of granite bowlders, clay, and gravel, the sea subsequently washed its sand.

The valley is narrow and necessitated a curve in the prism with a radius of 7,640 feet through the central wooded hill portion. The population is sparse, and contained in the three villages of Bourne, Bournedale, and Sandwich, with a total of only 3,000 persons.

The proximity of the Gulf Stream renders the climate of southeastern Massachusetts unusually mild, but the warm ocean current, especially during the summer months, creates fog. This, drifting with the prevailing southwest wind, envelops the Marthas Vineyard and Nantucket region, but, fortunately, the hook of the cape dissipates the mists to the extent of reducing the yearly 1,082 fog hours at Pollock Rip to 564 at Sandwich, and 277 at Buzzards Bay, giving a much clearer atmosphere at both ends of the canal. Experiments of the company during the past year have shown that ordinary electric lights are always visible at 2,000 feet.

The growth of New Bedford during the past 20 years has been greatly due to its equable, soft climate, and yet Massachusetts has scarcely appreciated the commercial advantages of Buzzards Bay. In the future its commercial activities should rival those of Narragansett Bay. At its upper end a rival to Providence is perfectly possible, where vessels which in the past have risked wreck off Chatham may in the future transfer to railroad or canal cargoes to and from the Panama Canal. How desirable such a port will be to the State may be realized when it is remembered that during half a century 2,000 vessels have been wrecked between Marthas Vineyard and Manomoy, over 700 lives lost, and property to the amount of half a million dollars has been annually destroyed.

The sympathy of two continents is rightfully given when thousands are drowned on board a Titanic or an Empress, while the sinking of a schooner or coaster passes with little notice.

Many stories of heroism and loss of life and property could be cited. The following is a recent experience and is given simply as a sample of what is yearly occurring off Cape Cod. No better argument could be given than this instance of the necessity of the safer route which is now provided by the Cape Cod Canal.

New England's winter coal supply begins to come by water during the early fall; hence the latter days of September, 1913, saw a large fleet of tows, barges, and schooners approaching the difficult passage between Marthas Vineyard and the mainland.

On October 2 the vessels commenced to enter Vineyard Sound with a fresh southwest wind. Passing through the 2½-mile passage lying to the northward of the western-

most shoals, with dirty weather, rain and fog, the leading vessels were compelled to anchor off Falmouth and over the bad grounds beyond. Then the wind backed around to northeast, blowing on the 5th and 6th at the rate of 40 miles an hour. On the 7th the weather moderated, but thick fog and rain followed until the 12th.

At this time there were 100 craft, containing on a conservative estimate 100,000 tons of coal and other raw material, all in dangerous positions and fouling one another during the squalls as the uncertain 3-knot current drifted them over the shoals.

On October 14 a violent northeaster sprang up, reaching a velocity of over 60 miles an hour on the following day. The day before, as the weather showed signs of clearing, the tugs had started with their tows to the eastward. When the gale struck them barges had to be abandoned, while schooners vainly endeavored to reach shelter.

The toll of the sea was as follows:

The barge Sumner R. Mead piled up on the tip of Cape Cod. The Oakland sank off Pamet River and her crew were drowned. The barge J. B. Thomas went to the bottom. The schooner Georgie Pearl was wrecked. The Henrietta A. Whitney and another schooner were badly damaged. The Henry D. May struck on Stone Horse Shoal after a collision with a tow of barges. The schooners Peter C. Schultz, Daniel McLeod, Horatio L. Foss, and Ruth E. Merrill suffered severely during the gale from either collision, loss of sails, or other damage. Seven lives were reported lost.

The gross tonnage of the lost vessels was 4,173.

The average delay in time for the whole fleet was 10 days.

The gross tonnage of each vessel, including the large barges, was about 750.

Omitting minor craft there were in the locality at the time 80 schooners and barges, exclusive of tugs; therefore there was in Vineyard Sound at the time a gross tonnage of 60,000.

A moderate operating cost per day of these 80 is $70 (including the pay for tugs), therefore the loss of 10 days by the fleet was $70 \times 10 \times 80$, $56,000.

The loss to life, cargo, and property doubled this amount, making a total during the 15 days of October of, say, $100,000.

The cargo of the fleet was at least 100,000 tons, therefore the loss was $1 on every ton carried.

Let us now assume that the canal had been finished and follow the fleet through the new channel.

On October 2 the leading vessels begin to enter Buzzards Bay. Its lower waters are four times as broad as the western portion of Vineyard Sound. They are deep and clear of reefs. The fog is over 50 per cent less. Little or no current exists. The strength of the southwest wind diminishes as the land breaks its force. Straight up, with comparatively clear weather, the ships run to Wings Neck, reaching the canal approach, where they steer through a line of lights and modern aids to navigation into the prism of the canal and thence, with a light northeast wind, make Boston on the 3d of October.

Meanwhile the belated craft are arriving off Wings Neck, remaining in quiet waters until the violent northeaster of the 5th and 6th is over. The large expensive ocean tugs which have brought the barges from Newport News have left and are on their way back for more coal, their places being taken by cheaper ones to tow the fleet to Boston. In succession, all the vessels arriving between the 7th and 13th make the run to their port in 15 hours from the time they arrive in the upper reaches of Buzzards Bay. (The company's log shows that there was no dense fog and only a light northeast wind along the canal line between the 7th and 13th of October.)

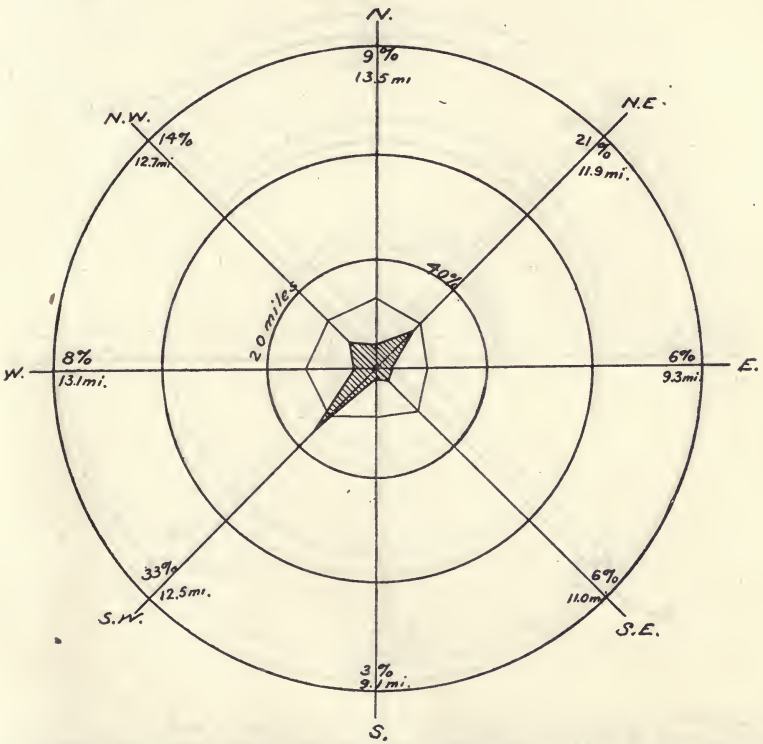
Careful navigators of craft arriving on the 13th would have remained in Buzzards Bay when the northeast gale began to blow on the 14th. If, however, the adventurous ones had gone through the canal they would have run much less risk than those who elected to go around the cape on the 15th, for after leaving the 3,000-foot breakwater in Barnstable Bay they would have been in over 50 feet of water and could have found a good lee at Provincetown 20 miles to the eastward.

Comparing the results of this trip with the figures on the one actually made we find as follows:

Assuming that one-half of the fleet had to remain in Buzzards Bay three days, we have $40 \times 70 \times 3$	$8,400
Add to this a toll of 10 cents per ton on 100,000 tons	10,000
	18,400
Loss by outside route	100,000
Or a net saving by the canal for the whole fleet of	81,600

WIND ROSE, 1914, SANDWICH, MASS.

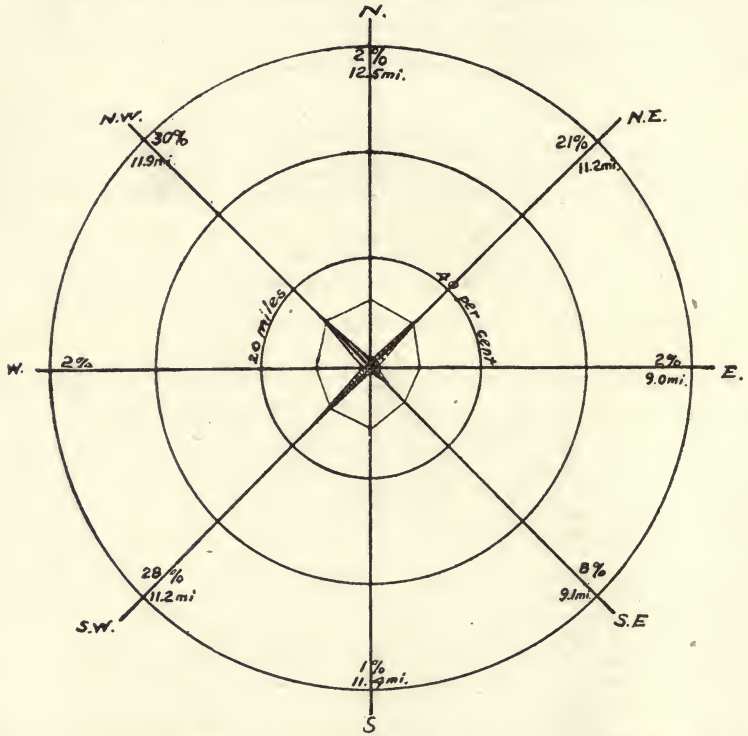
[Cape Cod Construction Co., Cape Cod Canal, office of the resident engineer.]



EXPLANATION OF DIAGRAM.—Radial lengths from focus in shaded area represent percentage of observations of prevailing direction. Radial lengths from focus in blank area represent true average hourly velocity in each direction. True average hourly velocity, 13.2.

WIND ROSE, 1915, SANDWICH, MASS.

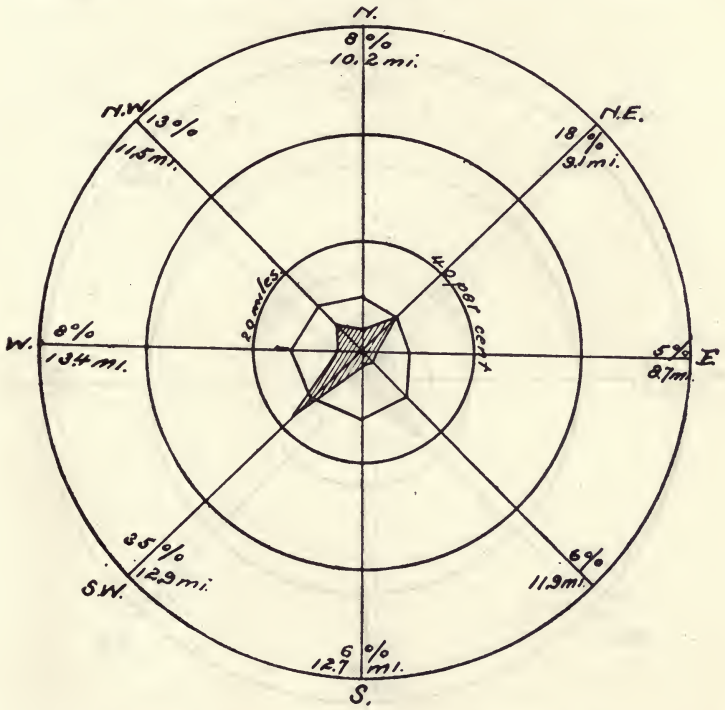
[Cape Cod Construction Co., Cape Cod Canal, office of the resident engineer.]



EXPLANATION OF DIAGRAM.—Radial lengths from focus in shaded area represent percentage of observations of prevailing direction. Radial lengths from focus in blank area represent true average hourly velocity in each direction. True average hourly velocity, 11.9.

WIND ROSE, YEAR OF 1913, SANDWICH, MASS.

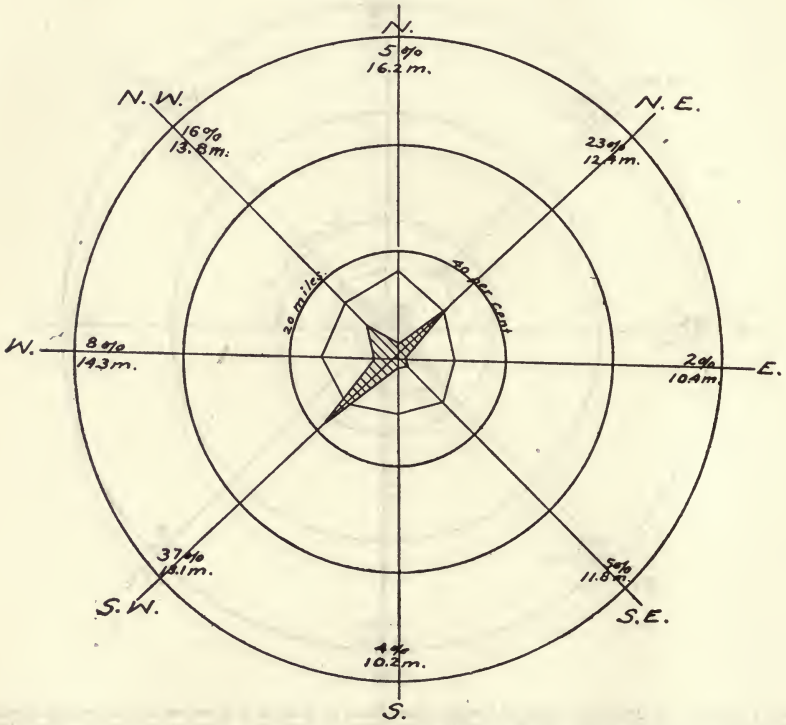
[Cape Cod Construction Co., Cape Cod Canal, office of the resident engineer.]



EXPLANATION OF DIAGRAM.—Radial lengths from focus in shaded area represent percentage of observations of prevailing direction. Radial lengths from focus in blank area represent true average hourly velocity in each direction. True average hourly velocity, 11.6.

WIND ROSE, 1910, SANDWICH, MASS.

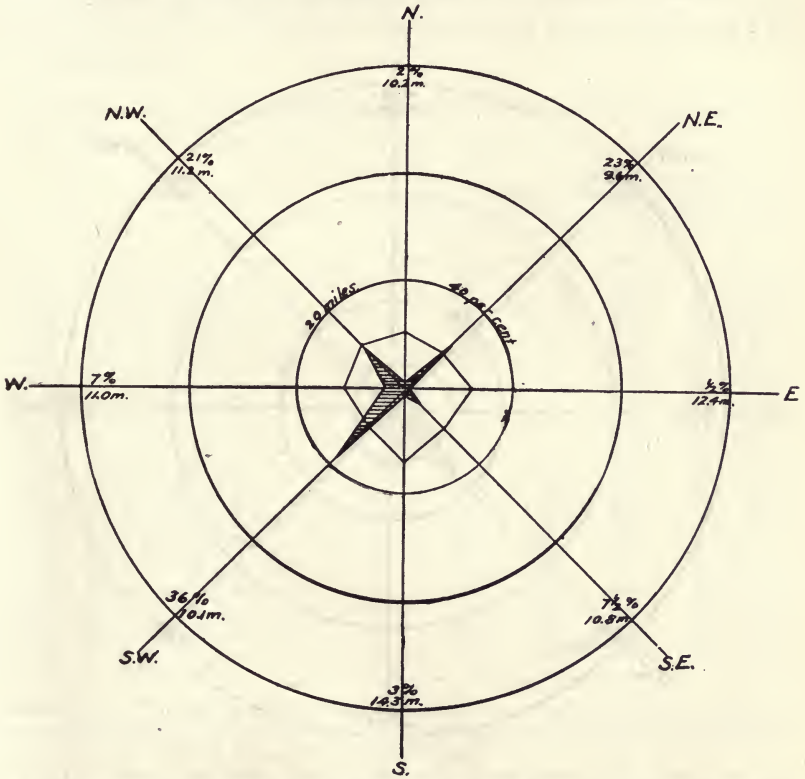
[Cape Cod Construction Co., Cape Cod Canal, office of the resident engineer.]



EXPLANATION OF DIAGRAM.—Radial lengths from focus in shaded area represent percentage of observations of prevailing direction. Radial lengths from focus in blank area represent average hourly velocity in each direction. Average hourly velocity, 13.1 m.

WIND ROSE, 1909, SANDWICH, MASS.

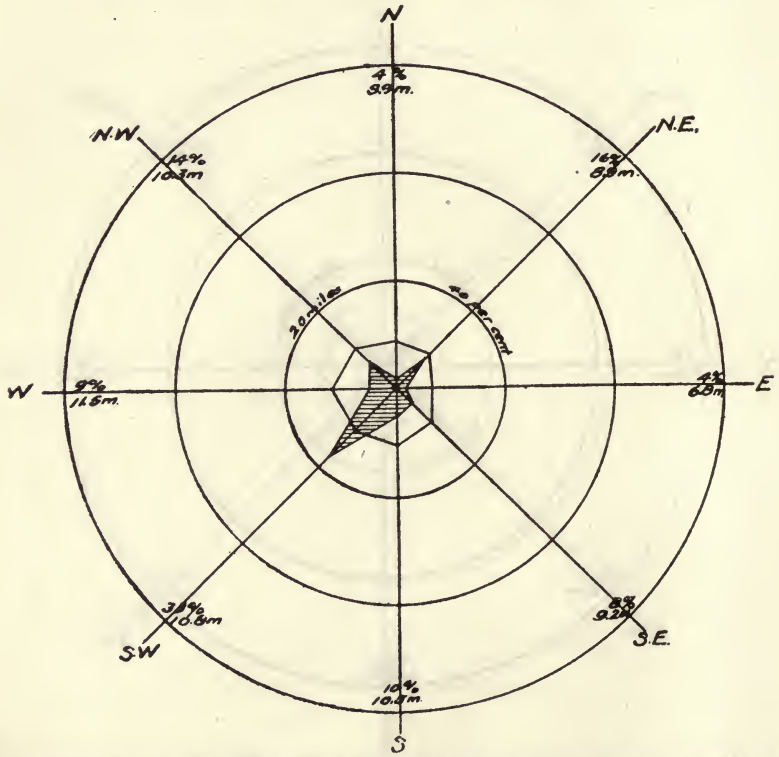
[Cape Cod Construction Co., Cape Cod Canal, office of the resident engineer.]



EXPLANATION OF DIAGRAM.—Radial lengths from focus in shaded area represent percentage of observations of prevailing direction. Radial lengths from focus in blank area represent average hourly velocity in each direction. Average hourly velocity, 10.5.

WIND ROSE, 1908, SANDWICH, MASS.

[Cape Cod Construction Co., Cape Cod Canal, office of the resident engineer.]



EXPLANATION OF DIAGRAM.—Radial lengths from focus in shaded area represent percentage of observations of prevailing direction. Radial lengths from focus in blank area represent average hourly velocity in each direction. Average hourly velocity, 10.1.

If, therefore, the worthy wish of the poverty-stricken Pilgrims for the smooth water channel had not been futile—if the desire of the men of the eighteenth century to save the lives of their sailor sons by joining the waters of the two bays had not failed—if the advice of Generals Washington and Knox had been taken—if the far-seeing men of Massachusetts, who during the nineteenth century gave money and brain to cut the Cape Cod Isthmus, had been properly backed—the record of loss during one of the fairest months of the year would never have been written as the latest chapter of the long story of wreck and disaster.

Exhibit E.

WINDS AT CAPE COD CANAL.

The following table gives a record of winds having a velocity which exceeded 40 miles per hour between 1908 and 1915, inclusive.

The prevailing winds are northeast and southwest; they blow across the canal and produce no direct effect.

Wind roses attached.

True wind velocities of more than 40 miles per hour, from 1908 to December, 1915.

Date.	Time.	Total movement in miles.	Duration in hours.	Maximum velocity in miles per hour	Mean velocity in miles per hour.	Direction.
Jan. 24, 1908	11.00 a. m.–12.00 m	40	1	40.8	40	NE.
Dec. 26, 1909	3.30 a. m.– 9.30 p. m.	799	18	55.2	44.4	NW.
Jan. 14, 1910	6.15 p. m.–10.15 p. m	160	4	42.2	40	NE.
Jan. 15, 1910	6.00 a. m.– 4.30 p. m.	436	10.5	45.1	41.5	N.
Feb. 1, 1910	8.45 a. m.– 1.00 p. m.	193	4.25	41.5	40.8	NW.
Feb. 4, 1910	10.00 a. m.– 3.00 p. m.	215	5	45.1	43	N.
Feb. 18, 1910	1.30 a. m.– 2.45 p. m.	52	1.25	43.7	41.5	NW.
Nov. 27, 1910	7.15 a. m.–10.15 a. m.	122	3	40.8	40.8	NW.
Mar. 16, 1911	7.00 a. m.– 9.30 a. m.	100	2.5	43.0	40	W.
July 29, 1911	3.30 p. m.– 5.30 p. m.	84	2	45.1	42.2	SW.
Dec. 28, 1911	1.15 p. m.– 2.15 p. m.	40	1	45.1	40.	W.
Feb. 22, 1912	9.00 a. m.– 1.30 p. m.	190	4.5	48.0	42.2	SW.
Mar. 15, 1912	8.30 p. m.– 9.30 p. m.	40	1	45.1	40	W.
Jan. 3, 1913	10.30 p. m.–10.45 p. m.	13	.25	42.2	42.2	SE.
Jan. 4, 1913	10.45 p. m.– 3.00 a. m.	222	4.25	45.1	40	SW.
Mar. 24, 1913	1.10 p. m.– 3.00 p. m.	93	1.83	42.2	41.3	SW.
Mar. 27, 1913	7.45 a. m.– 4.40 p. m.	443	8.9	46.6	40.5	S.
Jan. 12, 1914	4.15 p. m.– 5.25 p. m.	59	1.16	45.1	41.5	SW.
Jan. 13, 1914	1.00 a. m.– 1.15 a. m.	13	.25	41.5	41.5	NW.
Mar. 1, 1914	3.45 p. m.– 4.30 p. m.	36	.75	48.0	47.3	SE.
Dec. 13, 1914	11.35 p. m.–12.00 m	23	.58	40.8	40	SE.
Dec. 14, 1914	12.00 m. – 2.05 a. m.	85	2.08	42.2	40.8	NE.
Nov. 5, 1915	8.05 p. m.– 8.30 p. m.	17	.41	40.8	40.8	NW.
Dec. 13, 1915	5.00 p. m.– 7.30 p. m.	113	2.50	50.0	45	NE.

Question No. 7: The loss of life and property that has actually occurred in the last 40 years from wrecks on the eastern and southern shores of Cape Cod, including the sounds between Nantucket Island and the mainland.

Answer: This record was taken from the annual reports of the Coast Guard Service. There is attached and marked "Exhibit F[1]" a statement of the assistance rendered by Coast Guard cutters and stations involving the saving of life and property from 1875 to June 30, 1917. The record, however, is incomplete as to the property involved, property lost, lives lost, and vessels lost between the years 1903 and 1912. Taking the figures and the lives lost for the 30 years where the record in the exhibit is known, the average loss of life per annum is four.

During the 42 years shown in the exhibit 1,457 vessels were in trouble off Cape Cod or in the Vineyard or Nantucket Sounds—an average of 34 per year.

The value of the property involved and in trouble for the 33 years as shown in Exhibit F was $12,998,100, or an average for the 33 years of $393,881.81.

There is attached and marked "Exhibit F[2]" a blueprint of the coast from Fisher's Island to Cape Cod, showing the location of wrecks.

As a concrete illustration of the value of the canal toward the saving of life and property, it is recorded that during the storm of December 9 the tug Triton with two barges in tow bound for the canal from Boston, the tiller of the barge Maryland broke

and the vessel became unmanageable, which compelled the captain to anchor the barge in Cape Cod Bay about 2 miles off the breakwater at Sandwich.

The life-saving crew from Provincetown was summoned to take the crew off the barge but found that this was unnecessary when they arrived at the barge, and the barge remained anchored in Cape Cod Bay for two days until the storm had abated, when the tug came out from the canal and took the disabled barge through the canal to New York, after making temporary repairs while in the canal.

It is an unquestioned fact that if this barge had been proceeding around the cape in this storm, and the same accident had occurred, the barge and its crew would undoubtedly have been lost.

(EXHIBIT F.[1])

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917.

[Compiled by the United States Coast Guard.]

SUMMARY BY LOCALITIES.

Localities.	Vessels.		Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
	Sailing.[1]	Steam.[2]					
Cape Cod (ocean side)	127	29	75,342	$4,437,580	$520,225	1,671	26
Nantucket Shoals	5	2	4,988	440,700	20,000	109	5
Nantucket Island (including Muskeget Island)	21	5	3,524	144,210	22,505	155	.....
Nantucket Sound	47	14	42,919	2,296,595	221,400	612	.....
Marthas Vineyard	21	7	16,797	1,713,210	316,250	289	1
Vineyard Sound	34	14	44,535	3,729,630	553,390	1,064	.....
Total	255	71	190,105	12,761,920	1,653,770	3,900	32
	326						

CAPE COD.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1907.						
July 26	Bobs, British schooner	97	$3,425	$100	4	.....
Aug. 1	Ocean View, steamer	45	4,000	.....	8	.....
4	Albert Geiger, schooner	56	5,000	.....	18	.....
Sept. 11	Smuggler, schooner	119	8,000	.....	17	.....
12	Chanticleer, schooner	108	50,000	.....	16	.....
26	Edward R. Baird, jr., schooner	279	17,800	1,500	8	.....
Oct. 6	Freeman, bark	1,197	18,000	.....	18	.....
8	S. H. Sawyer, schooner	107	3,000	700	2	.....
30	Chester R. Lawrence, schooner	125	5,300	250	4	.....
31	Charles F. Mayer, steamer	1,218	80,000	.....	21	.....
Nov. 1	Garibaldi, Norwegian steamer	466	61,000	.....	15	.....
4	Ellen C. Burke, schooner	92	7,750	.....	20	.....
10	Emma R. Smith, British barkentine	392	7,200	500	9	.....
Dec. 4	Harold J. McCarty, schooner	312	12,000	.....	7	.....
4	Rebecca Shepherd, schooner	411	7,400	7,400	7	.....
1908.						
Jan. 7	Buena, schooner	100	10,600	8,300	17	.....
May 23	Mary L. Crosley, schooner	487	14,400	3,500	8	.....
Aug. 7	Metamora, schooner	116	11,000	.....	18	.....
Sept. 19	Albert D. Mills, British steamer	379	33,125	450	7	.....
Oct. 9	Edward Stewart, schooner	398	12,500	.....	11	.....
Nov. 30	Ira B. Ellens, schooner	305	15,000	800	6	.....
Dec. 11	Rebecca, schooner	79	8,160	.....	15	.....
22	Julia A. Berkele, schooner	168	35,000	500	5	.....
24	Harry Messer, schooner	627	27,000	17,000	8	.....
1909.						
Jan. 8	J. Arthur Lord, schooner	212	2,600	300	6	.....
Feb. 2	James Young, schooner	261	3,500	200	6	.....
Mar. 10	H. F. Dimock, steamer	2,625	475,000	20,000	89	.....
12	Fred A. Small, schooner	619	11,000	11,000	8	.....

[1] Including barges.

[2] Including gasoline vessels.

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917—continued.

CAPE COD—Continued.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1909.						
Apr. 10	Annie A. Booth, schooner	202	$7,000	$1,200	6	.....
May 6	Mary C. Santos, schooner	122	9,000	.....	23	.....
24	Theresa Wolf, schooner	307	8,200	500	6	.....
May 25	Abbie S. Walker, schooner	190	3,800	600	5	.....
June 15	Priscilla, schooner	44	7,000	775	10	.....
Aug. 4	Helvetia, schooner	499	35,000	.....	7	.....
5	Helen H. Benedict, schooner	770	11,000	.....	9	.....
17	Gretchen, gas	8	1,000	.....	.....	.....
27	Stroller, gas	46	10,000	.....	5	.....
Sept. 6	Henry D. May, schooner	278	6,000	200	8	.....
29	West Virginia, barge	1,564	60,000	.....	4	.....
Oct. 25	Minnie Slauson, schooner	317	11,000	200	6	.....
Nov. 7	Malwa, British barkentine	393	29,000	.....	8	.....
24	Virginia, steamer	2,027	450,000	150	112	.....
Dec. 2	Mizpah, British schooner	99	5,000	5,000	7	3
7	Nat Weador, schooner	278	12,000	500	5	.....
22	Florence Leland, schooner	343	11,000	.....	5	.....
22	Geo. H. Bills, gas	14	4,000	.....	3	.....
1910.						
Jan. 12	S. M. Bird, schooner	517	4,100	4,100	7	.....
21	S. G. Haskill, schooner	681	34,000	34,000	9	.....
May 3	Josephine De Costa, schooner	.....	13,000	.....	23	.....
16	David K. Akin, schooner	51	3,500	.....	2	.....
18	Seaconnett, schooner	65	7,000	.....	14	.....
Aug. 23	Lizzie Lane, schooner	231	2,000	.....	5	.....
29	Speculator, schooner	110	8,200	3,200	20	.....
29	Ada Ames, schooner	199	8,700	8,700	5	.....
Oct. 8	Martha P. Small, schooner	2,178	50,000	.....	14	.....
Nov. 6	George P. Hudson, schooner	2,258	67,000	.....	14	.....
18	Lucy May, schooner	104	5,000	100	4	.....
Dec. 31	Northland, steamer	2,047	137,000	3,000	13	.....
1911.						
Jan. 5	Silver Heels, schooner	134	6,000	6,000	4	.....
10	Pine Forest, barge	910	12,325	12,325	5	5
10	Treverton, barge	1,763	36,725	35,725	7	7
10	Corbin, barge	954	14,895	14,895	5	5
Mar. 5	Mattakeesett, schooner	77	9,000	9,000	15	.....
Apr. 26	Ella M. Stoner, schooner	449	7,985	.....	8	.....
30	Geo. D. Edmunds, schooner	541	35,000	500	6	.....
30	Metinic, schooner	261	26,000	.....	5	.....
May 3	Theresa Wolf, schooner	307	14,000	1,000	5	.....
July 3	Idle Hour, gas	9	900	.....	3	.....
9	Kershaw, steamer	2,599	659,000	500	88	.....
16	Wm. D. Hilton, schooner	324	14,000	.....	6	.....
18	Catawamteak, schooner	148	2,600	1,600	5	.....
Aug. 11	Theresa Wolf, schooner	307	14,000	14,000	7	.....
14	Pontiac, schooner	115	13,000	.....	17	.....
16	Spray, steamer	283	50,915	.....	19	.....
Oct. 27	Sam'l B. Hubbard, schooner	403	8,900	.....	6	.....
Nov. 16	Ella Clifton, schooner	108	2,600	400	4	.....
22	Henry May, schooner	188	5,000	250	5	.....
Dec. 1	William B. Herrick	499	7,600	300	7	.....
31	Sarah Quinn, schooner	113	5,400	1,050	3	.....
1912.						
Jan. 9	Wilhelmina, steamer	1,696	125,000	.....	22	.....
Feb. 10	Rhoda Holmes, schooner	375	17,700	100	5	.....
Mar. 24	William A. Morse, schooner	77	5,000	.....	22	.....
Apr. 9	Samuel Castner, jr., schooner	239	13,000	50	5	.....
20	Ellen M. Golder, schooner	651	5,000	250	9	.....
May 16	Stiletto, schooner	136	15,000	.....	18	.....
27	Muriel, schooner	120	8,000	1,200	17	.....
June 16	Kalemala, British schooner	96	4,000	1,500	4	.....
24	Sullivan Savin, schooner	676	5,000	325	8	.....
25	Larimer, steamer	3,737	.....	.....	31	.....
July 13	G. B. Clark, schooner	194	7,800	600	6	.....
18	Electric Flash, schooner	116	8,000	.....	17	.....
Sept. 12	Silver Spray, schooner	124	600	600	3	.....
13	Waquoit, steamer	17	1,500	.....	5	.....
30	Moonlight, schooner	198	10,200	200	6	.....

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917—continued.

CAPE COD—Continued.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1912.						
Sept. 30	Kolon, schooner	150	$3,250	$300	5	.....
Oct. 1	Willis & Guy, schooner	199	3,200	600	5	.....
7	Chas. A. Campbell,	1,586	30,750	2,225	10	.....
Nov. 18	Donna T. Briggs, schooner	204	8,500	.....	5	.....
20	Penobscot, steamer	2,294	225,900	.....	24	.....
Dec. 9	Lavolta, schooner	204	5,500	800	5	.....
9	Lizzie D. Small, schooner	190	7,300	.....	6	.....
11	Carrie A. Buckman, schooner	287	13,000	100	5	.....
25	J. Frank Seavey, schooner	412	22,000	300	6	.....
26	Donna T. Briggs, schooner	204	25,000	300	5	.....
1913.						
Feb. 6	Dresden, steamer	99	1,000	.....	9	.....
8	Lucia Portland, schooner	332	8,500	.....	7	.....
May 20	Ella L. Davenport, schooner	543	29,575	.....	7	.....
28	Governor Cleaves, gas	9	500	25	4	.....
Aug. 10	Parana, British schooner	155	4,500	4,500	5	.....
11	Sunshine, schooner	55	25,000	500	8	.....
12	Ox, gas	9	7,200	7,200	2	.....
23	W. H. Moody, schooner	75	4,200	600	13	.....
27	Sam & Priscilla, gas	50	.....	.....	9	.....
Sept. 1	Margaret Dillon, schooner	77	1,100	.....	16	.....
9	Two Brothers, gas	14	1,300	215	4	.....
17	M. E. Eldridge, schooner	252	7,000	250	4	.....
18	Pochassett, schooner	254	5,000	.....	5	.....
25	Nellie F. Sawyer, schooner	284	6,000	6,000	5	.....
Oct. 5	R. Bowers, schooner	435	5,900	300	7	.....
9	Quennepowitt, schooner	111	18,000	.....	19	.....
13	Oakland, schooner	926	19,650	19,650	2	2
14	Sumner R. Mead, schooner	1,035	12,500	12,500	3	.....
14	Henry D. May, schooner	278	8,500	6,500	6	.....
Nov. 2	Henriette Simmons	228	8,000	200	5	.....
Dec. 11	Grace Darling, British schooner	118	2,500	50	4	.....
1914.						
Jan. 12	Mount Hope, schooner	1,105	8,000	100	9	.....
14	Irene E. Meservey	244	4,500	150	6	.....
21	Gen. Adelbert Ames, schooner	476	11,000	6,830	8	.....
Feb. 11	Dustin G. Cressy, schooner	826	65,950	700	9	.....
15	Helen, gas	15	2,500	2,500	.....	.....
17	Castagna, Italian bark	843	70,000	70,000	4	4
Mar. 16	Terranova, schooner	138	13,500	13,500	23	.....
20	Ellen and Mary, schooner	142	15,000	50	23	.....
Apr. 8	American, British steamer	388	50,000	15,000	16	.....
12	Matanzas, bark	1,028	30,000	.....	7	.....
21	Victor, gas	121	12,000	100	20	.....
27	Margaret L., gas	23	.....	.....	8	.....
1915.						
Apr. 3	Tunnel Ridge, barge	955	50,000	50,000	5	.....
4	Coleraine, barge	954	50,000	50,000	5	.....
Aug. 11	Georgetta Lawrence, schooner	315	3,000	.....	3	.....
11	Emma McAdam, schooner	166	5,500	400	5	.....
Sept. 30	E. Marie Brown, schooner	456	25,000	.....	7	.....
Nov. 10	Chas. W. Alcott, schooner	280	11,500	.....	6	.....
12	Thos. Brundage, schooner	72	4,800	4,800	15	.....
13	Jennie A. Stubbs, schooner	198	4,500	.....	5	.....
17	Sam, catboat	6	1,000	.....	2	.....
1916.						
Jan. 25	Lewis K. Thurlow, steamer	3,178	300,000	.....	32	.....
June 27	Itasca, steamer	1,476	100,000	.....	14	.....
July 4	Carrie and Mildred, steamer	22	4,000	4,000	7	.....
28	Earl, British schooner	269	5,600	.....	9	.....
Aug. 9	Thos. S. Gorten, schooner	140	14,500	200	22	.....
Sept. 19	Emma M. Robinson, schooner	63	3,500	.....	4	.....
Oct. 27	Catawamteak, schooner	148	15,000	.....	3	.....
1917.						
Jan. 30	Annie Perry, schooner	116	7,000	685	19	.....
Apr. 13	Carrie Clark, barge	1,298	.....	.....	5	.....
13	W. F. Babcock, barge	2,198	.....	.....	5	.....
	Total	.....	4,437,580	520,225	1,671	26

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917—continued.

NANTUCKET SHOALS.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1910.						
June 12	Terranova, schooner	138	$12,000	$1,000	18	.....
Aug. 4	Joseph W. Fordney, steamer	2,297	365,000	10,000	31	.....
1913.						
Oct. 13	Georgia Pearl, British schooner	118	5,200	500	5	.....
Nov. 1	Annie M. Parker, schooner	133	10,000	4,000	14	5
1914.						
July 14	Galatea, schooner	65	4,000	4,000	18	.....
1915.						
Aug. 31	Marguerite Haskins, gas	101	9,000	500	18	.....
1916.						
July 29	J. B. Walker, barge	2,136	35,500	.....	5	.....
	Total	.....	440,700	20,000	109	5

NANTUCKET ISLAND.

1907.						
Sept. 22	Margie, catboat	11	$1,500	.....	6	.....
Nov. 9	Gypsy Maid, gas	9	3,000	.....	4	.....
1908.						
Jan. 6	Crusader, catboat	7	1,000	.....	6	.....
30	Frederika Schepp, barge	268	6,100	$6,100	9	.....
Apr. 2	Margie, catboat	11	1,500	.....	4	.....
5	Ruth, schooner	89	3,600	.....	2	.....
Dec. 12	Latonia, schooner	109	5,430	400	19	.....
1909.						
Feb. 1	J. Arthur Lord, schooner	212	2,000	200	6	.....
Mar. 24	Vigilant, schooner	11	300	.....	1	.....
July 18	Rosebud, catboat	6	300	50	.....	.....
Sept. 10	Benj. A. Smith, gas	146	14,150	.....	18	.....
Dec. 25	Belle Halliday, schooner	355	12,000	.....	6	.....
1910.						
Apr. 28	Nettie B. Debbin, schooner	92	2,650	.....	2	.....
May 16	Waquoit, steamer	17	2,600	25	4	.....
Dec. 16	Thos. B. Garland, schooner	348	8,380	3,480	6	.....
1912.						
Aug. 28	Julia A. Berkele, schooner	168	3,800	500	5	.....
1913.						
June 17	Regina, schooner	114	4,500	.....	4	.....
Aug. 3	Gaspee, steamer	113	30,000	.....	6	.....
1914.						
Jan. 13	No. 788, barge	566	2,000	.....	3	.....
Feb. 2	Ida, schooner	72	1,900	.....	2	.....
9	Geo. Churchman, schooner	282	6,600	.....	6	.....
Mar. 20	Fannie Bell Atwood, schooner	126	15,000	150	21	.....
1915.						
Oct. 9	Elinora Hill, gas	19	1,900	600	5	.....
1916.						
Mar. 7	Eliza Jane, schooner	29	1,000	.....	2	.....
7	John B. Norris, schooner	49	2,000	.....	2	.....
Dec. 25	Daniel McLoud, schooner	295	11,000	11,000	6	.....
	Total	.....	144,210	22,505	155	.....

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917—continued.

NANTUCKET SOUND.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1907.						
Oct. 7	Charlotte T. Sibley, schooner	376	$12,000	$2,000	7	.....
14	Wasp, schooner	14	600	600	2	.....
Nov. 7	Gertrude, catboat	6	150	150	2	.....
1908.						
Apr. 23	Abbie and Eva Hooper, schooner	321	8,500	2,423	7	.....
May 30	Belle Halliday, schooner	355	3,250	.....	6	.....
31	Phebe, catboat	6	200	200	3	.....
Oct. 30	Hersey D. Taylor, gas	16	1,000	.....	5	.....
Nov. 28	Florence A., schooner	154	7,200	2,800	5	.....
Dec. 18	Hersey D. Taylor, gas	15	1,000	.....	5	.....
1909.						
May 16	Electric Flash, schooner	116	7,000	.....	18	.....
Mar. 25	Crusader, catboat	7	600	.....	2	.....
July 4	Henry Withington, schooner	527	10,000	500	8	.....
Dec. 19	Mertie B. Crowley, schooner	2,824	135,000	2,200	14	.....
1910.						
Apr. 19	Thos. Brundage, schooner	72	5,000	500	14	.....
26	Eleanor F. Bertram, schooner	1,114	63,000	1,000	9	.....
May 2	Minnie Slausen, schooner	317	11,000	.....	8	.....
6	Gladys and Nellie, schooner	120	12,000	500	16	.....
16	Titania, schooner	106	6,000	.....	16	.....
Oct. 30	Sarah and Lucy, schooner	252	6,000	700	10	.....
Dec. 9	Hester, gas	10	2,300	50	4	.....
1911.						
July 6	Carrie A. Buckman, schooner	287	12,000	.....	6	.....
Aug. 2	Waquoit, steamer	17	2,300	.....	5	.....
19	Minnie, British schooner	135	1,900	125	4	.....
Nov. 17	Chas. H. Wolston, schooner	350	9,500	9,500	6	.....
Dec. 8	Flora Condon, schooner	230	5,100	500	5	.....
31	Sarah Quinn, schooner	113	7,600	3,100	3	.....
1912.						
Feb. 12	No. 16, barge	929	38,500	38,500	4	.....
Mar 18	Fannie Tracy, schooner	243	3,500	.....	6	.....
31	Elizabeth Palmer, schooner	3,065	9,000	.....	13	.....
May 10	Genesta, schooner	89	8,000	.....	16	.....
26	Francis P. Hesquia, schooner	105	12,000	2,500	17	.....
28	Nellie Irwin, gas	8	1,800	.....	2	.....
1913.						
Aug. 2	Gaspee, steamer	113	.....	.....	6	.....
Sept. 17	M. E. Eldridge, schooner	252	7,000	250	5	.....
20	Helen W. Martin, schooner	2,265	75,000	.....	11	.....
22	Marcus L. Uran, schooner	1,899	12,500	9,500	11	.....
Oct. 13	Emma F. Angell, schooner	862	11,200	.....	6	.....
1914.						
Jan. 12	Charles C. Lister, schooner	280	4,275	1,500	6	.....
12	G. M. Porter, schooner	143	4,000	4,000	5	.....
Feb. 2	Jane Palmer, schooner	5,188	92,000	800	13	.....
Dec. 5	Alice M. Lawrence, schooner	3,132	90,000	90,000	13	.....
21	Lansing, steamer	1,011	40,000	.....	9	.....
1915.						
Aug. 8	Nellie, gas	9	500	.....	3	.....
Oct. 11	Ontario, steamer	3,099	775,000	.....	116	.....
14	F. C. Lockhart, British schooner	309	24,500	.....	7	.....
Dec. 13	Dora, gas	6	550	550	.....	.....
24	Miltiadese Embiricos, Greek steamer	2,176	.....	.....	25	.....
1916.						
Jan. 20	L. T. Whitmore, schooner	440	7,420	.....	5	.....
Feb. 21	Middlesex, steamer	4,727	295,000	.....	30	.....
Mar. 7	Gardiner G. Deering, schooner	1,714	90,000	.....	11	.....
8	Estelle Krieger, schooner	1,047	72,000	.....	10	.....
16	William Bisbee, schooner	309	29,000	.....	6	.....
Sept. 2	Charles A. Dyer, schooner	22	1,000	1,000	7	.....
Oct. 7	Pontiac, schooner	116	13,500	13,500	19	.....

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917—continued.

NANTUCKET SOUND—Continued.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1916.						
Dec. 26	Ravola, British schooner	123	.....	.....	5	.....
26	Roger Drury, schooner	369	$6,600	.....	6	.....
26	Daniel McLoud, schooner	295	12,000	$12,000	6	.....
1917.						
Jan. 23	Minnie T. Racket, gas	8	450	450	.....	.....
Feb. 5	A. T. Sorrell, steamer	73	12,000	1,000	8	.....
8	Chas. E. Wyman, schooner	234	10,000	.....	5	.....
Apr. 24	Henry C. Barrett, schooner	1,807	208,000	20,000	10	.....
	Total	.....	2,296,595	221,400	612	.....

MARTHAS VINEYARD.

1907.						
July 19	Endymion, schooner	144	$35,000	$1,000	23	.....
Oct. 22	Mary and Bell, schooner	30	700	.....	2	.....
1909.						
Mar. 9	Massachusetts, steamer	4,029	923,000	50,000	63	.....
11	Tasco, steamer	319	63,000	2,000	16	.....
Apr. 14	Lake View, British bark	726	95,000	95,000	11	.....
Sept. 6	Fen Follett, yawl	24	8,000	.....	6	.....
Oct. 8	Empress, gasoline	10	2,500	.....	2	.....
Nov. 24	Nat. Ayer, schooner	140	7,000	1,000	5	.....
Dec. 25	Rebecca M. Walls, schooner	590	8,400	.....	6	.....
26	A. K. MacLean, British schooner	206	9,500	.....	6	.....
26	Maud Seaward, schooner	143	6,700	6,700	4	.....
1910.						
Jan. 23	Mertie B. Crowley, schooner	2,824	140,000	140,000	14	.....
Sept. 12	Ardent, steamer	106	.....	.....	18	.....
15	Fannie & Fay, schooner	233	6,000	.....	5	.....
Oct. 26	Henry W. Cramp, schooner	1,630	53,400	5,000	12	.....
Dec. 7	Olive May, gasoline	14	3,000	3,000	5	1
1911.						
Jan. 11	Mary E. Olys, schooner	224	5,500	1,000	5	.....
Mar. 22	Richard, steamer	401	60,000	500	16	.....
1912.						
Feb. 4	Henry P. Hallock, schooner	138	2,100	50	3	.....
1913.						
Mar. 22	Basile, British schooner	182	10,000	10,000	5	.....
Oct. 22	Rebecca J. Moulton, schooner	589	9,500	.....	6	.....
Dec. 8	Brigadier, schooner	310	9,000	.....	5	.....
1915.						
Apr. 15	Roger Drury, schooner	360	3,500	450	7	.....
15	Geo. E. Klinck, schooner	560	35,000	.....	6	.....
Sept. 8	Caroline Gray, schooner	327	12,000	.....	6	.....
22	Silver Leaf, British schooner	341	10,000	.....	7	.....
1916.						
June 4	Exter, schooner	1,780	64,410	.....	7	.....
13	New England, steamer	417	126,000	550	18	.....
	Total	.....	1,713,210	316,250	289	1

VINEYARD SOUND.

1907.						
Aug. 2	Waccama, steamer	1,359	$185,800	$5,695	20	.....
Sept. 2	James S. Steele, schooner	78	6,000	6,000	10	.....
18	Susie H. Davidson, schooner	546	19,500	1,500	7	.....
18	Horace A. Stone, schooner	1,376	76,000	450	10	.....
Oct. 24	Hannah F. Carleton, schooner	225	11,000	1,200	5	.....

LIST OF CASUALTIES OCCURRING TO VESSELS ON CAPE COD (OCEAN SIDE), NANTUCKET SHOALS, NANTUCKET ISLAND (INCLUDING MUSKEGET ISLAND), NANTUCKET SOUND, MARTHAS VINEYARD ISLAND, AND VINEYARD SOUND, FOR A PERIOD OF 10 YEARS, VIZ: FROM JULY 1, 1907, TO JUNE 30, 1917—continued.

VINEYARD SOUND—Continued.

Date.	Vessel.	Tonnage.	Value of property involved.	Value of property lost.	Persons on board.	Lives lost.
1908.						
Feb. 2	S. O. Co. No. 57, schooner	1,381	$60,000	$15,000	8	.....
6	S. O. Co. No. 7, steamer	117	25,000	2,500	10	.....
Mar. 14	Silvia, British steamer	1,708	222,285	222,285	74	.....
Apr. 29	Katahdin, steamer	1,380	176,000	21,000	21	.....
May 1	Arizona, British schooner	99	5,000	.....	4	.....
July 19	Wm. L. Douglas, schooner	3,708	265,000	.....	19	.....
Sept. 19	Eleanor A. Percy, schooner	3,401	117,000	.....	15	.....
1909.						
Jan. 23	Gypsum King, steamer	581	150,000	4,000	21	.....
May 16	Jennie French Potter, schooner	1,993	59,500	59,500	11	.....
June 14	S. M. Bird, schooner	517	.....	.....	.....	.....
Aug. 8	Maud B. Krum, schooner	687	20,400	200	11	.....
Oct. 11	Georgiette, schooner	141	5,000	.....	4	.....
13	Sam'l J. Goucher, schooner	2,547	110,000	.....	14	.....
Nov. 15	E. Arcularius, schooner	99	3,250	.....	3	.....
1910.						
June 18	Storm Petrel, schooner	174	5,300	.....	5	.....
Oct. 10	Minnue Slausen, schooner	317	11,000	.....	7	.....
1911.						
Jan. 2	Kennebec, steamer	2,183	165,000	81,000	21	.....
July 4	Julia & Martha, schooner	117	3,840	3,000	5	.....
Aug. 2	Susan N. Pickering, schooner	336	6,500	1,000	6	.....
4	Bunker Hill, steamer	4,799	1,020,000	78,000	525	.....
18	Bertha, bark	177	13,000	3,000	30	.....
Sept. 24	H. M. Whitney, steamer	2,706	300,000	.....	28	.....
Nov. 12	Bertha F. Walker, schooner	676	18,000	18,000	9	.....
18	Abbie & Eva Hooper, schooner	321	5,000	3,750	7	.....
1912.						
Mar. 5	Franklin, schooner barge	910	.....	.....	5	.....
5	Knickerbocker, schooner barge	954	.....	.....	5	.....
Oct. 11	Wilfrid M., British schooner	252	12,600	300	6	.....
1913.						
Oct. 2	Eda J. Morse, gasoline	9	800	.....	4	.....
23	Hattie H. Barbour, schooner	301	8,380	360	6	.....
Nov. 2	No. 782, schooner	924	15,950	600	4	.....
Dec. 13	Charles Luling, schooner	195	3,700	3,700	5	.....
1914.						
Mar. 18	Gracie Smith, schooner	12	600	600	3	.....
Aug. 10	Ida, schooner	37	800	.....	2	.....
Oct. 19	Fred B. Bolano, schooner	263	9,625	3,000	6	.....
1915.						
Nov. 14	Lucia Porter, schooner	284	6,000	500	6	.....
Dec. 4	Childe Harold, schooner	676	18,000	750	8	.....
1916.						
Feb. 24	Juanita, steamer	2,537	4,300	500	45	.....
June 28	Geshia, steamer	47	5,000	1,500	8	.....
July 29	Julia A. Berkele, schooner	168	1,000	.....	4	.....
Sept. 15	No. 21, schooner barge	905	40,000	3,000	4	.....
1917.						
Jan. 18	Champion, gasoline	13	6,000	1,500	1	.....
May 23	Tampico, steamer	2,261	500,000	10,000	24	.....
June 2	Ethel, steamer	38	12,500	.....	8	.....
	Total	.....	3,729,690	553,390	1,064	.....

EXHIBIT F.[2]

STATEMENT OF THE WRECKS AROUND CAPE COD, TAKEN FROM GOVERNMENT FIGURES.

Statement of assistance rendered by Coast Guard cutters and stations, involving the saving of life and property, July 1, 1916, to June 30, 1917.

	Number of vessels.	Tonnage.	Value of—		Persons on board.	Lives saved and persons rescued from peril.	Persons succored.
			Vessel.	Cargo.			
Documented vessels	70	4,029	$295,060	$242,695	224	44	20
Miscellaneous assistance	54	12,303	.....	.....	267	.....	8
Total	124	16,332	295,060	242,695	491	44	28

Statement of assistance rendered by Coast Guard cutters and stations, involving the saving of life and property, July 1, 1915, to June 30, 1916.

	Number of vessels.	Gross tonnage.	Estimated value of—		Persons on board.	Lives saved and persons rescued from peril.	Persons succored.
			Vessel.	Cargo.			
Documented vessels	60	12,638	$534,800	$113,490	231	21	12

Statement of assistance rendered by Coast Guard cutters and stations, involving the saving of life and property, July 1, 1914, to June 30, 1915.

	Number of vessel.	Gross tonnage.	Estimated value of—		Persons on board.	Lives saved and persons rescued from peril.	Persons succored.
			Vessel.	Cargo.			
Documented vessels	58	13,080	$320,940	$120,420	297	102	19
Miscellaneous assistance	24	6,023	.....	.....	129	.....	15
Total	82	19,103	320,940	120,420	426	102	34

Casualties within scope of life-saving stations July 1, 1913, to June 30, 1914.

	Number of vessels.	Gross tonnage.	Estimated value of—			Property lost.	Persons on board.	Persons lost.
			Vessel.	Cargo.	Vessel and cargo.			
Documented vessels	49	18,083	$645,300	$113,880	$759,180	$171,465	377	6
Undocumented vessels	36	.....	15,695	.....	.....	520	56	.....
Foundered	1	410	.....	.....	.....	.....	6	1
Stranded	1	133	.....	.....	.....	.....	14	5
Total	87	18,626	660,995	113,880	759,180	171,985	453	12

Casualties within scope of life-saving stations, July 1, 1912, to June 30, 1913.

	Number of vessels.	Gross tonnage.	Estimated value of—			Property lost.	Persons on board.	Persons lost.
			Vessel.	Cargo.	Vessel and cargo.			
Documented vessels	35	9,354	$379,400	$126,765	$506,165	$18,510	243	.....
Undocumented vessels	23	.....	21,730	.....	.....	945	46	.....
Foundered	1	1,295	.....	.....	.....	.....	5	2
Total	59	10,649	401,130	126,765	506,165	19,455	294	2

Places where vessels have stranded, 1904 to 1914, inclusive.

	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	Total.
Cape Cod	11	16	6	19	15	10	10	10	10	8	11	126
Cape Cod Bay	9	3	1	1	9	7	4	1	1	3	1	40
Marthas Vineyard	2	6	7	7	2	3	7	6	1	1	2	44
Nantucket	3	6	.....	.....	5	1	5	2	3	3	3	31
Nantucket Sound	3	9	4	6	8	5	8	1	7	2	8	61
Nantucket Shoals	.....	.....	.....	1	.....	.....	1	2	.....	1	1	6
Vineyard Sound	2	4	4	4	7	7	4	5	8	2	3	50
Total	30	44	22	38	46	33	39	27	30	20	29	358

Statement of wrecks and casualties on and near Cape Cod, Mass.

[From the records of the United States Life Saving Service from July 1, 1875, to May, 1903, about 28 years.]

	Number of vessels.	Property involved.	Property lost.	Lives lost.	Vessels lost.
July 1, 1875, to June 30, 1895	473	$6,111,920	$1,615,245	63	137
July 1, 1895, to Dec. 31, 1898	102	2,468,960	267,870	27	28
Jan. 1, 1899, to Dec. 3, 1899	29	412,965	34,925	.....	6
Jan. 1, 1900, to May, 1903	83	1,111,505	261,575	15	26
Total	687	10,105,350	2,179,615	105	197

Question No. 8: The saving in the event of Government ownership that would accrue from the shortened run and the lessened risk (if it shall be shown to exist) to Government vessels other than naval vessels, to wit: Vessels of the Coast Guard of the Treasury Department, the Coast and Geodetic Survey, the Lighthouse Service, the Fisheries Service, the Navigation Service of the Commerce Department, vessels of the War Department, and others.

Answer: The passage of Government vessels from Cape Cod Bay to the waters to the south of Cape Cod Bay would get the advantage of the shorter route by going through the canal than they would if no canal were there.

Question No. 9: The amount and character of the traffic at present using the canal or which may reasonably be expected to do so in the future. This includes a statement of the relative amount of traffic now passing through Pollock Rip as compared with that passing through the canal.

Answer: There is attached and marked "Exhibit G" files showing the date, name of vessel, owner, character of vessel, and estimated gross tonnage of vessels which have used the canal for the months of May, June, and July, 1916, and the months of November and December, 1916, January and February, 1917, and also the vessels which have passed around the cape during the months mentioned above. The estimated gross tonnage of tugs towing vessels, both through the canal and around

the cape is not shown. The reports were compiled from daily reports of "shipping news," New York Herald. Only commercial vessels are shown.

From these reports for the months of May, June, and July, 1916, the number of vessels passing through the canal was 1,169, estimated gross tonnage 995,363; and for the same period there passed around the cape 3,954 vessels, estimated gross tonnage 4,106,290.

From these reports for the months of December, 1916, and January and February, 1917, the number of vessels passing through the canal was 727, estimated gross tonnage 707,004; and for the same period there passed around the cape 2,808 vessels, estimated gross tonnage 3,477,709.

The actual number of vessels which passed through the canal during the year 1916 was 4,589 and the actual gross tonnage was 3,611,939. The six months' figures, as shown above, for number and estimated gross tonnage of vessels reported passing around the cape, if doubled, will give the approximate number of vessels reported per annum as 13,524 and the estimated gross tonnage as 15,167,998. Total vessels, 18,113; total tons, 18,779,937.

Referring to above figures, two things must be kept in mind: First, that they apply only to commercial vessels; second, that gross tonnage is given, the total going through the canal and around the cape being 18,779,937.

The total of 18,779,937 tons would represent the tonnage of only those vessels which pass through the canal and around the cape and as reported in the "shipping news," New York Herald. Not included in these figures there would be additional tonnage of tugs, yachts, foreign vessels, and Government vessels, all of which would aggregate about 6,500,000 tons per annum, making a total of 25,279,937 coastwise tons per annum.

Appendix C, Part 2.

Exhibit G.

DAILY REPORTS OF TRAFFIC OF COMMERCIAL VESSELS THROUGH CAPE COD CANAL AND AROUND CAPE COD FOR MONTHS OF NOVEMBER AND DECEMBER, 1916, JANUARY AND FEBRUARY, 1917.

[Reports copied from American Shipping, New York Herald.]

Daily reports contained in this file are for 94 days from October 31, 1916, to February 27, 1917, Saturday's reports not shown, and other dates missing, but the reports shown equal three months.

The steamer *Bayport* sunk in canal on December 13, 1916, and the daily reports following that date show a decrease in traffic through the canal.

RECAPITULATION.

	Vessels through Cape Cod Canal.	Vessels around Cape Cod.
Steamers	114	745
Scows	8	.....
Dredges	3	.....
Tugs	129	571
Barges	281	1,338
Schooners	163	154
Government vessels	6	.....
Lighters	23	.....
Total	727	2,808
Estimated gross tonnage	707,004	3,477,709

Gross tonnage of tugs towing vessels not shown.

CAPE COD CANAL.

OCTOBER 31, 1916.

Passed west, U. S. submarine LI	300
Passed east:	
Tug John G. Chandler, barge Caddo, Mexico Petroleum Co	1,000
Tug May towing 2 barges, Chas. Griny	2,000
Tug Jos. E. Riorden	99
Schooner yacht Elemah	16
Steamer Massachusetts	4,779
Steamer Bunker Hill	4,779
	12,673

BOSTON.

Arrived:	
Steamer Ontario from Norfolk, Mer. & Min. T. Co	3,099
Steamer City of Memphis for Savannah, Savannah Line	5,252
Steamer Harvey H. Brown from Norfolk	2,673
Steamed:	
Steamer Nacoochee for Savannah, Savannah Line	2,680
Steamer Dorchester for Philadelphia, Mer. & Min. T. Co	2,537
Steamer Grecian for Norfolk, Mer. & Min. T. Co	2,827
West, tug Patience—	
Barge Westmoreland, F. W. Munn	600
Barge Harrisburg	2,100
Barge Reading	2,100
Highland Light, wind 5 p. m., NE., 10 miles, foggy, smooth sea:	
Passed steamer Norfolk for Norfolk, Coastwise S. S. Co	3,521
Chatham, wind 5 p. m., NE., light breeze, cloudy and foggy:	
Passed steamer Herman Winter for New York, Eastern S. S. Co	2,625
Nobska, wind 5 p. m., 5 miles, cloudy:	
Passed east, tug Covington—	
Barge G. R. Skolfield, Seaboard T. Co	1,728
Barge Kennebec, Seaboard T. Co	2,048
Passed west, schooner J. Howell, Leeds	414
Vineyard Haven, wind 5 p. m., N., fresh, choppy sea, cloudy:	
Passed west—	
Schooner Neva (Br.)	191
Schooner J. Manchester, Haynes	795
Schooner Brigadier	310
Steamed east—	
Tug Wyoming towing 3 barges, Lehigh Valley R. R	3,000
Tug S. T. Co., No. 2, barges Nos. 6 and 123	1,000
Schooner Chas. H. Klinck	522
Schooner Harry W. Haynes	295

In canal:		Around cape:	
Submarines	1	Steamers	8
Steamers	2	Tugs	5
Tugs	3	Barges	11
Barges	3	Schooners	6
Schooners	1	Total	30
Total	10	Tonnage, estimated	40,317
Tonnage, estimated	12,973		

NOVEMBER 1, 1916.

Passed east, lighter Cornelia, B. S. & C. Co 285
Passed west:
Tug Uncas .....
Tug Perth Amboy towing 3 barges, Lehigh Val. R. R. Co 3,000
Steamer Massachusetts, Eastern S. S. Co 4,779
Steamer Bunker Hill, Eastern S. S. Co 4,779

BOSTON.

Arrived:
Steamer Kershaw from Baltimore, Mer. & Min. T. Co 2,599
Steamer Cretan from Philadelphia, Mer. & Min. T. Co 2,350
Steamer H. M. Whitney from New York, Eastern S. S. Co 2,706
Steamed:
Steamer Cratheus for Philadelphia .....
Steamer City of Memphis for Savannah, Ocean S. S. Co 5,292
Steamer Esparto for New York, Esparto S. S. Co 3,297
Steamer Colorado for New York, Mallory S. S. Co 2,764
Steamer Harvey H. Brown for Norfolk 2,673
Steamer Ontario for Baltimore, Mer. & Min. T. Co 3,099
Tug International—
Barge Molino 954
Barge Brookside 841
Barge Ontelaunce 739
Highland Light, wind SW. 10 miles, foggy, smooth sea:
Passed west, tug Standard—
Barge No. 5, Stand. T. Co 1,000
Barge No. 57, Stand. T. Co 1,000
Nobska:
Passed west, steamer Grecian, Mer. & Min. T. Co 2,827
Passed east—
Tug Georges Creek—
Barge No. 14, Con. Coal Co 1,600
Barge No. 17, Con. Coal Co 1,600
Barge No. 24, Con. Coal Co 2,800
Tug Gwalia, barge Harvard, N. E. C. & C. Co 2,100
Passed west, tug Gypsum King towing barge, J. B. King Co 1,000
Vineyard Haven:
Arrived east, tug Murrell—
Barge John Winstead, N. E. C. & C. Co 841
Barge Beattie 1,950

In canal:		Around cape:	
Lighters	1	Steamers	10
Tugs	2	Tugs	6
Barges	3	Barges	12
Steamers	2		
Total	8	Total	28
Tonnage, estimated	12,843	Tonnage, estimated	44,032

NOVEMBER 2, 1916.

Passed east:
Tug Nottingham towing 3 barges, L. & W. C. Co 3,000
Schooner Emma S. Briggs 294
Schooner Sarah Castner, Jr 239
Schooner D. W. B. (Br.) .....
Passed west:
Tug Stoneybrook towing 3 barges, L. & W. C. Co 2,400
Tug Jos. O. Rioden towing 3 barges 2,100
Schooner Susan P. Oliver 272
Schooner Irene Meservey 244
Schooner James Young 261
Schooner Ida B. Gibson 235
Schooner Nat. Meader 278
Steamer Massachusetts 4,779
Steamer Bunker Hill 4,779

BOSTON.

Arrived:
- Steamer John G. McCullough from Norfolk 1,895
- Steamer Gloucester from Norfolk, Mer. & Min. T. Co 2,541
- Steamer Dimock from New York, East S. S. Co 2,625
- Tug Chuktowaga—
  - Barge 783, Lehigh Valley R. R 1,625
  - Barge 766 910
  - Barge 784 1,625

Steamed:
- Steamer Cretan for Philadelphia, Mer. & Min. T. Co 2,350
- Steamer Kershaw for Baltimore, Mer. & Min. T. Co 2,599
- Steamer H. M. Whitney for New York, East S. S. Co 2,706
- Tug Paoli—
  - Barge Haverford, Sus. Coal. Co 678
  - Barge Radnor, Sus. Coal Co 678
  - Barge Upton, Sus. Coal Co 843
- Tug Western—
  - Barge Forest Belle, N. Y., O. & W. R. R 1,333
  - Barge Liberty, N. Y., O. & W. R. R 856
  - Barge Metacomet, N. Y., O. & W. R. R 1,450
- Tug Mars—
  - Barge Bear Ridge, Reading R. R 910
  - Barge Poxtana, Reading R. R 954
  - Barge Chas. F. Pritchard, Reading R. R 800
- Tug J. T. Scully—
  - Barge Gov. Robie, Luck. S. S 1,000
  - Barge J. F. Chapman 1,000

Highland Light, wind 5 p. m. calm, clear, smooth:
- Passed east, schooner Susan N. Pickering 336
- Passed west—
  - Tug Germantown—
    - Barge Saucon, Reading 955
    - Barge Tardley, Reading 963
    - Barge Phoenix, Reading 901
  - Steamer Corsica 368

Chatham, wind SW., moderate breeze, hazy:
- Passed east, steamer Matao.

Nobska, wind WSW., 20 miles, smoky.

Vineyard Haven, wind SW., moderate, hazy, smooth:
- Arrived east, schooner Eliza A. Scribner (Br.) 351
- Arrived west, schooner Carrie E. Look 530
- Arrived east—
  - Schooner Isaiah K. Stetson 313
  - Schooner B. Hazard 392
  - Tug Ontario towing 3 barges, N. Y., O. & W. R. R 2,400
  - Tug Standard towing 2 barges, Stan. T. Co 3,000
  - Tug Tamaqua towing 3 barges, Reading 2,800
- Sailed east—
  - Schooner Myrtle Leaf (Br.) 336
  - Schooner Henry H. Chamberlain 245
  - Schooner Methebesec 376
  - Schooner Chas. C. Lister 280
  - Schooner John A. Beckerman 485
  - Schooner Lydia H. Roper 321
  - Schooner Margaret May Riley (Br.) 240

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	3	Tugs	3
Barges	9	Barges	17
Schooners	8	Schooners	13
Total	22	Total	41
Tonnage, estimated	18,881	Tonnage, estimated	44,970

NOVEMBER 3, 1916.

Passed east:
- U. S. destroyer Reid 700
- Steamer Katahdin, Clyde S. S. Co 2,696
- Steamer America, G. Nor. Paper Co 1,205
- Barge Newark, Chadwick 313
- Barge Hatteras, Chadwick 788
- Barge E. R. Haggett, Chadwick 400
- Barge Sharon, Saml. Cabot 482
- Schooner Telumah 230

Passed west:
- Schooner Gracie D. Chambers 379
- Schooner Lizzie Lane 231
- Schooner F. D. French 200
- Schooner Odell 141
- Schooner Chas. Wyman 234
- Tug Calvert—
  - Barge Nor. No. 2 500
  - Barge Ruth 435
  - Barge Runama Shaw 473
- Steamer Massachusetts 4,779
- Steamer Bunker Hill 4,779

BOSTON.

Arrived:
- Steamer City of Atlanta from Savannah, Ocean S. S. Co 5,433
- Steamer Bay State from Norfolk, White Oak S. S 1,245
- Steamer Indian from Philadelphia, Mer. & Min. T. Co 2,110
- Steamer Powhatan from Norfolk, Mer. & Min. T. Co 2,898
- Steamer Arlington from Lamberts Point, N. E. C. & C. Co 2,431
- Steamer Jas. S. Whitney from New York, East S. S. Co 2,707
- Tug Nottingham—
  - Barge L. & W. C. No. 4, L. & W. Coal Co 700
  - Barge L. & W. C. No. 5, L. & W. Coal Co 700
  - Barge L. & W. C. No. 14, L. & W. Coal Co 800

Steamed:
- Steamer Gloucester for Baltimore, Mer. & Min. T. Co 2,541
- Steamer Walter D. Noyes for Sewalls Point .....
- Tug Gwalia—
  - Barge Cassie, N. E. C. & C. Co 948
  - Barge Clara, N. E. C. & C. Co 828
  - Barge Bessie, N. E. C. & C. Co 640

Highland light, wind 5 p. m., 25 miles, partly cloudy, smooth:
- Passed east, tug Fred E. Richards—
  - Barge Pohatcong, Chadwick Co 800
  - Barge P. & R. L. Co. No. 1, Chadwick Co 800
  - Barge P. & R. L. Co. No. 6, Chadwick Co 800

Chatham, wind 5 p. m., NNW., moderate breeze, cloudy:
- Passed east—
  - Tug Lykens, barge Cacossing, Reading R. R 721
  - Tug Chas. P. Greenough—
    - Barge Hattie, N. E. C. & C. Co 1,286
    - Barge H. F. Hooper, N. E. C. & C. Co 800
- Passed west—
  - Tug Essex—
    - Barge R. R. L. Co. No. 5, Chadwick Co 800
    - Barge Albany, Chadwick Co 659
    - Barge Panther Creek, Chadwick Co 600
  - Tug Gettysburg towing barge, Reading R. R 750

Nobska, wind p. m. NW. 14 miles, clear:
- Passed east—
  - Tug Carlisle—
    - Barge Maple Hill, Reading R. R 911
    - Barge Moslem, Reading R. R 963
    - Barge Neshaming, Reading R. R 721
  - Tug Valley Forge—
    - Barge Logan, Reading R. R 955
    - Barge Paxtang, Reading R. R 954
    - Barge Tabor, Reading R. R 963

Nobska—Continued.
Passed west—
Tug Cuba, Barge Mount Hope, Staples Co..... 1,801
Tug Binghamton..... 1,462
Steamer Herman Winter, East S. S. Co..... 2,625
Passed east, steamer Ruth, A. H. Bull S. S. Co..... 3,102
Vineyard Haven, wind NW., fresh, breeze, clear, choppy sea:
Arrived west—
Schooner Perce (Br.).....
Schooner Adonis (Br.)..... 316
Schooner Halifax (Br.)..... 1,078
Schooner Lizzie Lane..... 231

In canal:		Around cape:	
Steamers	4	Steamers	10
Tugs	1	Tugs	11
Barges	6	Barges	14
Schooners	6	Schooners	4
Total	17	Total	39
Tonnage, estimated	18,965	Tonnage, estimated	47,879

NOVEMBER 5, 1916.

Passed west:
Steamer Katahdin, Clyde S. S. Co..... 2,696
Schooner Sallie E. Ludlam..... 237
Barge Benefactor, N. Y. & Boston Trans. Co..... 827
Barge Eugenia Hopper, N. Y. & Boston Trans. Co..... 730
Tug Cheektowaga towing 3 barges, Lehigh Valley R. R..... 2,400
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Passed east:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Barge Baltimore, Boston Ship Brok. Co..... 650
Barge J. P. Fields, James Hughes, jr..... 444
Tug Eliza Blackwell..... 27

BOSTON.

Arrived:
Tug Prudence—
Barge Elk Gorden, F. W. Munn..... 900
Barge Lariner, F. W. Munn..... 800
Tug Catawissa—
Barge Wiconisco, Reading R. R..... 956
Barge Bethayres, Reading R. R..... 955
Barge Marion, Reading R. R..... 954
Tug Swatara—
Barge Mingo, Reading R. R..... 954
Barge Glendower, Reading R. R..... 855
Tug Sea King, barge Flora, N. E. C. & C. Co..... 865
Tug Lehigh—
Barge No. 791, Lehigh Valley R. R. Co..... 600
Barge No. 790, Lehigh Valley R. R. Co..... 600
Barge No. 701, Lehigh Valley R. R. Co..... 934
Steamer Dorchester from Philadelphia, Mer. & Min. T. Co..... 2,537
Steamer Joancy from Newport News.....
Steamer Grecian from Newport News, Mer. & Min. T. Co..... 2,827
Steamed, steamer City of Atlanta for Savannah, Ocean S. S. Co..... 5,433
Vineyard Haven, wind 5 p. m. NE., fresh, choppy, cloudy:
Arrived—
Tug Georges Creek towing barges, Con. Coal Co..... 2,400
Steamer Clifford..... 212
Schooner Beryl.....
Schooner M. Corkum.....

In canal:		Around cape:	
Steamers	3	Steamers	5
Tugs	2	Tugs	6
Barges	7	Barges	14
Schooners	1	Schooners	2
Total	13	Total	27
Tonnage, estimated	17,569	Tonnage, estimated	22,782

NOVEMBER 7, 1916.

Passed west:
- Tug Pallas, Boston Tow Boat Co. 80
- Tug Neponsit, towing 2 barges, Doane Tow Boat Co. 1,600
- Tug May, towing 2 barges, Chas. Greny. 1,600
- Barge Hooper. 730
- Barge Mary Kennelly, Jas. Hughes, jr. 480
- Barge Martin P. Horan, Jas. Hughes, jr. 373
- Steamer Massa. 4,779

Passed east:
- Schooner Addie P. McFaddon. 251
- Schooner Sarah Eaton. 199
- Schooner Rhoda Hohnes. 375
- Schooner Winnegance. 257
- Steamer Bunker Hill, Eastern S. S. Co. 4,779

BOSTON.

Arrived:
- Steamer Kershaw from Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Bay View from Norfolk, White Oak T. Co. 1,399
- Steamer Corsica from Norfolk. 368
- Steamer Bristol from Norfolk. 257

Steamed:
- Steamer Nantucket for Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Dorchester for Philadelphia, Mer. & Min. T. Co. 2,537
- Steamer Melrose for Sewall Point, N. E. C. & C. Co. 5,107
- Steamer Everett for Sewall Point, N. E. C. & C. Co. 5,107
- Steamer Brandon for Baltimore, N. E. C. & C. Co. 2,431

Vineyard Haven, wind, light, variable, smooth, clear:

Passed east—
- Tug Boswell, towing 3 barges, N. E. C. & C. Co. 2,400
- Tug Standard, towing 3 barges, N. E. C. & C. Co. 2,400
- Tug Patience—
  - Barge Westmoreland, F. W. Munn. 900
  - Barge Harrisburg, F. W. Munn. 900
  - Barge Reading, F. W. Munn. 900
- Steamer Clifford. 212

In canal:		Around cape:	
Steamers	2	Steamers	10
Tugs	3	Tugs	3
Barges	7	Barges	9
Schooners	4		
Total	16	Total	22
Tonnage, estimated	15,503	Tonnage, estimated	30,116

NOVEMBER 8, 1916.

Passed west:
- Steamer America, G. Nor. Paper Co. 1,205
- Tug Thos. Yorke. 45
- Tug Beatrice. 29
- Tug Nottingham—
  - Barge No. 1, L. & W. Coal Co. 900
  - Barge No. 9, L. & W. Coal Co. 700
  - Barge No. 8, L. & W. Coal Co. 953

Passed east:
- Schooner James Rothwell 498
- Schooner Latooka 200
- Schooner Sarah L. Davis 180
- Tug Prudence—
  - Barge Karl, J. W. Munn 408
  - Barge Varina, J. W. Munn 441
  - Barge Lottie, J. W. Munn 425
- Steamer Massa 4,779
- Steamer Bunker Hill 4,779

BOSTON.

Arrived:
- Steamer Harvey H. Brown from Norfolk 2,673
- Steamer Ontario from Baltimore, Mer. & Min. T. Co 3,099
- Steamer Cretan from Philadelphia, Mer. & Min. T. Co 2,350
- Steamer Esparto from New York, Esparto S. S. Co 3,297
- Steamer Walter D. Noyes from Newport News .....
- Tug Monocacy—
  - Barge Cumru, Reading R. R 1,780
  - Barge Eagel Hill, Reading R. R 911
  - Barge Barry, Reading R. R 954
- Tug Chas. W. Barker, jr.—
  - Barge Helen, N. E. C. & C. Co 1,285
  - Barge Edith, N. E. C. & C. Co 859
  - Barge Lermond, N. E. C. & C. Co 800

Steamed:
- Steamer Bristol for Norfolk 257
- Steamer Middlesex for Norfolk, Coastwise Trans. Co 4,727
- Steamer Coastwise for Norfolk, Coastwise Trans. Co 4,015
- Steamer Kershaw for Baltimore 2,599

Highland Light, wind 5 p. m. SW., 25 miles, clear, smooth:
- Passed west, tug Sea King, Barge Hattie, N. E. C. & C. Co 1,286

Chatham, wind 5 p. m. SW., fresh breeze, clear:
- Passed west, tug Catawissa—
  - Barge Oak Hill, Reading R. R 910
  - Barge Oley, Reading R. R 1,780

Nobska, wind 11.15 a. m. WSW., 15 miles, fair:
- Passed east, steamer City of Everett, barge 89 400

Vineyard Haven, wind NW., heavy rough sea, clear:
- Arrived west—
  - Schooner Lena F. Oxner (Br.) 200
  - Tug Fred E. Richards—
    - Barge Nequeshoning, Lehigh Coal 967
    - Barge R. & R. L. Co. No. 3 900
    - Barge R. & R. L. Co. No. 4 .....
- Passed east, steamer Binghamton 1,462
- Passed west, steamer Ruth, A. H. Bull S. S. Co 3,102
- Passed east, tug Germantown—
  - Barge Pennypak, Reading R. R 739
  - Barge Tohickon, Reading R. R 739
  - Barge Enterprise, Reading R. R 901
- Passed west, tug Swatava—
  - Barge Lincoln, Reading R. R 855
  - Barge Robesconia, Reading R. R 955
  - Barge Cacoosing, Reading R. R 721
- Passed east, schooner Eliza A. Scribner (Br.) 200

In canal:		Around cape:	
Steamers	3	Steamers	12
Tugs	4	Tugs	7
Barges	6	Barges	19
Schooners	3	Schooners	2
Total	16	Total	40
Tonnage, estimated	15,542	Tonnage, estimated	45,723

NOVEMBER 9, 1916.

Passed east:
- Tug Watuppa, Staples T. Co.... 190
- Schooner Buena.... 200
- Schooner Julia Frances.... 183
- Barge Chemung, C. W. Chadwick & Co.... 671
- Barge Chenango, C. W. Chadwick & Co.... 671
- Barge Eastern, C. W. Chadwick & Co.... 700

Passed west:
- Schooner American Team.... 376
- Schooner Abbie S. Walker.... 190
- Schooner Gilbert Stancliffe.... 117
- Barge Baltimore, Boston S. B. Co.... 750
- Steamer Massachusetts, Eastern S. S. Co.... 4,779
- Steamer Bunker Hill, Eastern S. S. Co.... 4,779

BOSTON.

Arrived, steamer Powhattan from Norfolk, Mer. & Min. T. Co.... 2,898

Steamed:
- Steamer Ontario for Norfolk, Mer. & Min. T. Co.... 3,099
- Steamer Cretan for Philadelphia, Mer. & Min. T. Co.... 2,350
- Steamer Bay State for Sewalls Point, White Oak T. Co.... 1,245
- Steamer Corsica for Norfolk.... 368
- Steamer San Jose for Norfolk, Pac. Mail S. S. Co.... 2,135
- Tug Boswell—
  - Barge Beattie, N. E. C. & C. Co.... 1,117
  - Barge Flora, N. E. C. & C. Co.... 865
- Steamer Magda (S. W.) for New York.... 2,351
- Steamer Joancy for Norfolk....

Highland Light, wind 5 p. m. SW., 25 miles, hazy, smooth:
- Passed east, steamer Inland....
- Passed west—
  - Steamer J. H. Devereux, Metro. Coal Co.... 1,615
  - Tug Standard No. 2—
    - Barge No. 6, Standard T. Co.... 800
    - Barge No. 123, Standard T. Co.... 800

Chatham, wind 5 p. m. SW., fresh breeze, part cloudy:
- Passed east—
  - Steamer Arlington, N. E. C. & C. Co.... 2,431
  - Tug International—
    - Barge Richardson, Reading R. R.... 693
    - Barge Leesport, Reading R. R.... 963
    - Barge Suffolk, Reading R. R.... 855

Vineyard Haven, wind SW., heavy rough sea, clear:
- Arrived east—
  - Schooner Mary E. Morse.... 644
  - Tug Piedmont—
    - Barge No. 10, Con. Coal Co.... 897
    - Barge No. 18.... 936
    - Barge No. 23.... 900
  - Schooner King Josiah (Br.).... 200
- Arrived west, tug Sea King, barge Harry F. Hooper.... 730

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	1	Tugs	5
Barges	4	Barges	11
Schooners	5	Schooners	2
Total	12	Total	29
Tonnage, estimated	13,606	Tonnage, estimated	28,892

NOVEMBER 10, 1916.

No report in Herald.

BOSTON.

Arrived:
- Steamer Tuscon from Norfolk, Mer. & Min. T. Co..... 2,415
- Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
- Steamer Arlington from Sewalls Point, N. E. C. & C. Co..... 2,431
- Steamer Nachoochie from Savannah, Ocean S. S. Co..... 2,680
- Steamer Bay View from Sewalls Point, White Oak T. Co..... 1,399
- Tug International—
  - Barge Bast, Reading R. R..... 693
  - Barge Neshaming, Reading R. R..... 721
  - Barge Manatawny, Reading R. R..... 721

Steamed:
- Steamer Elizabeth Weems from Newport News .....
- Steamer Powhatan for Baltimore, Mer. & Min. T. Co..... 2,898
- Steamer Selwyn Eddy for Norfolk, Mer. & Min. T. Co..... 2,846
- Tug Calvert—
  - Barge Marion, Erie R. R..... 700
  - Barge Scranton, Erie R. R..... 500
- Tug Patience—
  - Barge Penn, F. W. Munn..... 1,849
  - Barge Larimer, F. W. Munn..... 1,000
- Steamer Harvey H. Brown for Norfolk 2,673

Highland Light, wind 5 p. m. SW., 7 miles, clear, smooth.

Chatham, wind 5 p. m. SW., light breeze, clear.

Nobska, wind 1 p. m. NW., 4 miles, clear:
- Passed—
  - Steamer Currier for New York, Cuba Distilling Co..... 4,711
  - Tug Gypsum King towing 2 barges, J. B. King Co..... 1,600

Vineyard Haven, wind W., moderate, smooth, clear:
- Passed east, tug Paoli—
  - Barge Nanticoke, P. Dougherty..... 1,000
  - Barge Malvern, P. Dougherty..... 800
  - Barge Radnor, P. Dougherty..... 678
- Passed west—
  - Steamer North Star, Eastern S. S. Co..... 3,159
  - Tug Standard No. 2—
    - Barge 1, Standard T. Co..... 800
    - Barge 2..... 800
    - Barge 3..... 800

In canal:
No report in Herald.

Around cape:

Steamers	11
Tugs	6
Barges	15
Total	32
Tonnage, estimated	39,984

NOVEMBER 12, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co..... 4,779
- Steamer James S. Whitney, Eastern S. S. Co..... 2,707
- Tug Standard No. 2, barge No. 120, Standard T. Co..... 1,000
- Tug Pallas—
  - Barge Ida Woods, Jas. Hughes, jr..... 524
  - Barge Helen Woods, Jas. Hughes, jr..... 515

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co..... 4,779
- Steamer H. M. Whitney, Eastern S. S. Co..... 2,706
- Lighter Cornelia, Boston S. & G. Co..... 285
- Tug Prudence—
  - Barge Karl, F. W. Munn..... 408
  - Barge Varina, F. W. Munn..... 441
- Schooner Nellie Eaton..... 118

Passed west—Continued.
- Schooner Lillian 99
- Schooner Fanny and Fay 233
- Schooner W. R. Perkins 178
- Schooner Charlotte T. Sibley 376
- Ravolta (Br.) 147
- Emma McAdam 166
- Alaska 173
- Henrietta Simmons 228
- St. Croix 234
- Colin C. Baker 410
- Barge Gibson, Staples T. Co 839

BOSTON.

Arrived:
- Steamer Dorchester, from Philadelphia, Mer. & Min. T. Co 2,537
- Steamer Nantucket, from Norfolk, Mer. & Min. T. Co 2,599
- Tug Carlisle—
  - Barge Saucon, Reading R. R 955
  - Barge Draper, Reading R. R 855
  - Barge Brookside, Reading R. R 841
- Tug Mars—
  - Barge Chas. S. Pritchard, Reading R. R 861
  - Barge Ontelaunce, Reading R. R 739
- Tug Cheektowaga—
  - Barge 705, Lehigh Valley R. R 934
  - Barge 795, Lehigh Valley R. R 400
  - Barge 742, Lehigh Valley R. R 700
- Tug Wyoming—
  - Barge 793, Lehigh Valley R. R 500
  - Barge 707, Lehigh Valley R. R 934
  - Barge 741, Lehigh Valley R. R 700
- Tug Lykens—
  - Barge Phoenix, Reading R. R 901
  - Barge Bear Ridge, Reading R. R 910
  - Barge Monitor, Reading R. R 955
- Tug Piedmont, towing 3 barges, Con. Coal Co 2,700

Vineyard Haven, wind W., moderate, smooth, cloudy:
- Arrived east—
  - Tug Cuba, barge Mount Hope, Staples Trans. Co 1,801
  - Schooner William M. Crichett 544
  - Steamer North Land 3,282
- Arrived west—
  - Schooner Dean E. Brown 719
  - Schooner Lizzie Lane 231

In canal:

Steamers	4
Steam lighters	1
Tugs	3
Barges	6
Schooners	11
Total	24
Tonnage, estimated	21,345

Around cape:

Steamers	3
Tugs	6
Barges	18
Schooners	2
Total	29
Tonnage, estimated	25,698

NOVEMBER 13, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Steamer America, G. Nor. Paper Co 1,205
- Steam lighter Cornelia, Boston S. & G. Co 285
- Tug Eastern, towing 3 barges 2,400
- Tug Mexpet, towing 2 barges, Mex. Pet. Co 1,600

Passed west:
- Steamer Massachusetts, Eastern S. S. Co 4,779
- Tug Standard No. 2, towing barge 120, Standard T. Co 800

BOSTON.

Arrived:
- Steamer Grecian, from Baltimore, Mer. & Min. T. Co..... 2,827
- Steamer Brandon, from Baltimore, N. E. C. & C. Co..... 2,431
- Steamer City of Atlanta, from Savannah Ocean S. S. Co..... 5,433

Steamed:
- Steamer City of Memphis, from Savannah, Ocean S. S. Co..... 5,252
- Steamer Panaman, for New York, American H. S. S. Co..... 6,649
- Steamer Everett, for Newport News, N. E. C. & C. Co..... 5,107
- Steamer Nantucket, for Baltimore, Mer. & Min. T. Co..... 2,599
- Tug Mars—
  - Barge Westmoreland, F. W. Munn..... 256
  - Barge Elk Gardner, F. W. Munn..... 847

Highland Light, 5 p. m., wind NW., 5 miles, foggy, smooth.

Chatham, 5 p. m., wind N., very light breeze, cloudy:
- Passed west—
  - Tug Carlisle—
    - Barge Barry, Reading R. R..... 954
    - Barge Glendower, Reading R. R..... 855
    - Barge Marion, Reading R. R..... 954
  - Tug Gettysburg—
    - Barge Herndon, Reading R. R..... 1,763
    - Barge Mingo, Reading R. R..... 954

Nobska, 1.15 p. m., wind NE., 4 miles, foggy:

Vineyard Haven, wind, a. m., NE., light breeze, foggy; p. m., calm, cloudy, smooth:
- Arrived east, schooner Catawamteak..... 148
- Arrived west, schooner F. C. Pendleton..... 408
- Arrived east—
  - Tug North American, towing 3 barges..... 2,400
  - Tug Valley Forge—
    - Barge Skippack, Reading R. R..... 739
    - Barge Macungie..... 956
    - Barge Exeter..... 1,780

In canal:		Around cape:	
Steamers	3	Steamers	7
Steam lighters	1	Tugs	5
Tugs	3	Barges	13
Barges	6	Schooners	2
Total	13	Total	27
Tonnage, estimated	15,848	Tonnage, estimated	43,312

Boston, November 13.—Pumps have been put on board steamer Chippewa, and it is expected she will be pumped out and towed here Wednesday night or Thursday morning.

NOVEMBER 14, 1916.

No report in Herald.

BOSTON.

Arrived:
- Steamer Ontario from Norfolk, Mer. & Min. T. Co..... 3,099
- Steamer Dorchester for Philadelphia, Mer. & Min. T. Co..... 2,537
- Steamer Grecian for Norfolk, Mer. & Min. T. Co..... 2,827
- Steamer Hylas (Br.) for Norfolk..... 2,749
- Steamer Hampden for Baltimore, Coastwise T. Co..... 4,725
- Steamer Middlesex for Norfolk, Coastwise T. Co..... 4,727

Highland Light, 5 p. m., wind, N., 20 miles, cloudy, smooth sea.

Vineyard Haven, wind, NE., fresh, choppy sea, thick and rainy:
- Arrived east—
  - Tug Richmond—
    - Barge Accidental, Seaboard T. Co..... 1,532
    - Barge Kentucky, Seaboard T. Co..... 1,575
  - Tug Tacony—
    - Barge Coastwise, Chadwick Co..... 800
    - Barge Musconetcong..... 800
    - Barge Shamokin, Sus. Coal Co..... 829

Vineyard Haven—Continued.
Arrived east—Continued.
Tug Carlisle—
Barge Merrian, Reading R. R..... 855
Barge Glendower, Reading R. R..... 855
Barge Barry, Reading R. R..... 954

In canal:
No report in Herald.

Around cape:

Steamers	6
Tugs	3
Barges	8
Total	17
Tonnage, estimated	28,864

NOVEMBER 15, 1916.

Passed east:
Steamer H. M. Whitney, Eastern S. S. Co..... 2,706
Tug Tuton, Lamberts P. & T. Co..... 259
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Passed west:
Steamer Jas. S. Whitney, Eastern S. S. Co..... 2,707
Steamer Massachusetts, Eastern S. S. Co..... 4,707
Tug John A. Hughes—
Barge Magnolia, Jas. Hughes, jr..... 151
Barge Eliza Blackwell, Jas. Hughes, jr..... 400

BOSTON.

Arrived:
Steamer Kershaw from Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Cretan from Philadelphia, Mer. & Min. T. Co..... 2,350
Steamed:
Steamer Hostilius (Br.) for New York..... 3,325
Steamer Ontario for New York, Mer. & Min. T. Co..... 3,099
Steamer Chinese Prince (Br.) for New York, Mer. & Min. T. Co..... 4,825
Steamer Melrose for Sewalls Point, N. E. C. & C. Co..... 5,107
Steamer City of Atlanta for Savannah, Ocean S. S. Co..... 5,433
Tug Boxer—
Barge Ephrata, Reading R. R..... 954
Barge Maple Hill, Reading R. R..... 911
Barge Moselem, Reading R. R..... 963
Tug Chas. W. Parker, Jr., barge No. 10, Com. T. B. Co..... 800
Tug Cheektowaga—
Barge No. 790, Lehigh Valley..... 600
Barge No. 784, Lehigh Valley..... 919
Barge No. 783, Lehigh Valley..... 923
Tug Mars—
Barge Westmoreland, F. W. Munn..... 256
Barge Elk Garden, F. W. Munn..... 900
Tug Paoli—
Barge Devon, Sus. Coal Co..... 724
Barge Oxford, Sus. Coal Co..... 836
Barge Strafford..... 678
Tug Wyoming—
Barge 767, Lehigh Valley..... 600
Barge 741, Lehigh Valley..... 700
Highland Light, wind, 5 p. m., NE., 12 miles, cloudy, moderate sea:
Passed east, steamer H. F. Dimock (supposed), Eastern S. S. Co..... 2,625
Nobska, wind, 5 p. m., NE., 12 miles, cloudy:
Passed west, steamer John G. McCullough..... 1,895
Vineyard Haven, wind, NE., fresh, choppy sea, cloudy:
Arrived east, schooner Norma P. Coolen (Br.)..... 200
Arrived west, schooner A. B. Sherman..... 611
Arrived east—
Tug Nottingham, towing 3 barges, L. & W. Coal..... 2,400
Tug Fred E. Richards, towing 3 barges, R. & R. L. Co..... 2,400
Arrived west, Tug Cuba, Staples T. Co..... 594
Arrived east, steamer Joancy.....
Arrived west, schooner E. Marie Brown..... 456

In canal:		Around cape:	
Steamers	4	Steamers	10
Tugs	2	Tugs	9
Barges	2	Barges	20
		Schooners	3
Total	8	Total	42
Tonnage, estimated	15,709	Tonnage, estimated	48,683

NOVEMBER 17, 1916.

Passed east:
- Tug Honeybrook, towing 3 barges, L. & W. C. Co 2,100
- Tug Standard No. 2, barge 86 800
- Schooner Chas. H. Trickery 281
- Schooner Jennie A. Stubbs 198
- Schooner Spartel 132
- Schooner John Bracewell 224
- Schooner Lavolta 204
- Schooner Jessie Ashley (Br.) 200
- Steamer Bunker Hill 4,779

Passed west:
- Steamer Massachusetts 4,779
- Schooner Harry W. Haynes 295
- Schooner Wanolo (Br.) 272
- Schooner Jas. Rothwell 498
- Tug Cheektowage, towing 3 barges 2,100
- Tug Alert 23
- Tug Frances Beckwith, barge Easton, Staples T. Co 531

BOSTON.

Arrived:
- Steamer Powhattan from Baltimore, Mer. & Min. T. Co 2,898
- Steamer Indian from Philadelphia, Mer. & Min. T. Co 2,110
- Steamer J. H. Devereux from Philadelphia, Metro. Coal Co 1,618
- Steamer City of Augusta from Savannah, Ocean S. S. Co 2,869
- Tug Cumberland—
  - Barge No. 15, Con. Coal Co 912
  - Barge No. 19 932
  - Barge No. 21 905
- Tug Standard—
  - Barge S. T. Co. No. 5 795
  - Barge S. T. Co. No. 57 700

Steamed: Steamer Tuscan for Baltimore, Mer. & Min. T. Co 2,415

Highland Light, wind 5 p. m. SE. 7 miles, cloudy, smooth sea:
- Passed east—
  - Steamer North Land, Northland 3,282
  - Tug Gypsum King, barge Canada, J. B. King Co 800
  - Tug Swatara—
    - Barge Bethayres, Reading R. R 955
    - Barge Manheim, Reading R. R 955
    - Barge Paxtang, Reading R. R 954
- Passed west, steamer H. F. Demock (supposed) 2,625

Chatham, wind E., very light breeze, part cloudy:
- Passed west, steamer Paul Paix (Br.) 4,196

Nobska:
- Passed east, tug Western—
  - Barge Liberty 856
  - Barge Forest Belle 1,333
  - Barge Cadosia 756
- Passed west, steamer Matoa 2,311
- Passed east, steamer Selwyn Eddy 2,946

Vineyard Haven, wind SE., moderate, p. m. thick and rainy, smooth sea:
- Arrived west—
  - Schooner Eva C. (Br.) 298
  - Schooner Arbitrator 106

Vineyard Haven—Continued.
Arrived east—
Tug Lehigh, towing 3 barges, Lehigh Valley..... 2,400
Tug Nottingham, towing 3 barges, L. & W. Coal Co..... 2,400
Tug North America—
Barge Coastwise, C. W. Chadwick..... 800
Barge Rahn, C. W. Chadwick..... 932
Arrived west—
Steamer Binghamton..... 1,462
Schooner Willie L. Maxwell..... 315

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	5	Tugs	8
Barges	8	Barges	20
Schooners	9	Schooners	3
Total	24	Total	42
Tonnage, estimated	17,416	Tonnage, estimated	46,736

In canal:		Around cape:	
Steamers	5	Steamers	14
Tugs	1	Tugs	7
Barges	2	Barges	15
Schooners	6	Schooners	2
Total	14	Total	38
Tonnage, estimated	20,704	Tonnage, estimated	46,648

Schooner Catawateak arrived Vineyard November 13; sailed November 19.
Tug Tacony, barges Musconetcong, Shamokin, and Coaldale arrived Vineyard November 14; arrived Boston November 19.
Tug Richmond, with barges Kentucky and Occidental, arrived in Boston November 19. This tow arrived at the Vineyard November 14.

NOVEMBER 19, 1916.

Passed east:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Steamer H. M. Whitney, Eastern S. S. Co..... 2,706
Steamer Annie B. Mitchell..... 463
Steamer Mary A. Hall..... 381
Steamer Seth M. Todd..... 194
Schooner St. Bernard (Br.)..... 137
Schooner Rebecca G. Whillden..... 220
Schooner Susan P. Oliver..... 272
Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Steamer Jas. S. Whitney, Eastern S. S. Co..... 2,707
Steamer Katahidin, Clyde Line..... 2,696
Tug Honeybrook—
Barge No. 4, L. & W. Co..... 685
Barge No. 5, L. & W. Co..... 685

BOSTON.

Arrived:
Steamer Grecian from Norfolk, Mer. & Min. T. Co..... 2,827
Steamer Bristol from Norfolk..... 284
Steamer Dorchester from Philadelphia, Mer. & Min. T. Co..... 2,537
Tug Monocacy—
Barge Langhorne, Reading R. R..... 955
Barge Henry Clay, Reading R. R..... 841
Barge Mahoney, Reading R. R..... 855
Steamed:
Steamer Powhattan for Norfolk, Mer. & Min. T. Co..... 2,898
Steamer Indian for Philadelphia, Mer. & Min. T. Co..... 2,110
Steamer J. H. Devereux, Metro. Coal Co..... 1,618

Steamed—Continued.
- Steamer Amolco for Sewalls Point, Boston Molasses Co 3,074
- Steamer City of Augusta for Savannah, Ocean S. S. Co 2,869
- Steamer Clan MacDonald (Br.) for Philadelphia 4,839
- Steamer Malden for Sewalls Point 5,107
- Steamer Walter D. Noyes for Sewalls Point .....
- Tug Gwalia: Barge Biwabik, N. E. C. & C. Co 1,401
- Tug International—
  - Barge Leesport, Reading R. R 963
  - Barge Tardley, Reading R. R 963
  - Barge Suffolk, Reading R. R 855
- Tug Catawissa—
  - Barge Pennypack, Reading R. R 739
  - Barge Tohickin, Reading R. R 739
  - Barge Enterprise, Reading R. R 901
- Tug Lehigh—
  - Barge No. 791, Lehigh Valley 600
  - Barge No. 742, Lehigh Valley 800
  - Barge No. 795, Lehigh Valley 600

Vineyard Haven, wind W., moderate, smooth sea, clear:
- Arrived, schooner B. H. Warford 203
- Passed east—
  - Steamer Inland .....
  - Steamer Meteor, Pacific Coast S. S. Co 2,301
  - Steamer H. F. Dimock, Eastern S. S. Co 2,625
  - Tug Calvert, towing barge P. Dougherty 800
- Passed west, tug Waltham, barge Norhern No. 6, Staples T. Co 800
- Sailed east, schooner Wm. M. Critchett 544

NOVEMBER 20, 1916.

Passed east:
- Tug S. T. Co. No. 2—
  - Barge No. 123, S. T. Co 952
  - Barge No. 6, S. T. Co 795
- Tug May, barge No. 2, Chas. Gring 1,600
- Barge Rose M. Feeney, Jas. Hughes 515
- Schooner Florence and Lillian 252
- Schooner Palmetto 97
- Steamer Massachusetts, Eastern S. S. Co 4,779

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Steamer Black Rock, barge Iron Queen 1,384
- Steamer Stonybrook 101
- Barge John C. Fields, Jas. Hughes 444

BOSTON.

Arrived:
- Steamer Harvey H. Brown from Norfolk 2,673
- Steamer Nantucket from Baltimore, Mer. & Min. T. Co 2,599
- Steamer Macoochee from Savannah, Ocean S. S. Co 2,680
- Tug Gettysburg—
  - Barge Temple, Reading R. R 963
  - Barge Buck Ridge, Reading R. R 915
  - Barge Manatawny, Reading R. R 721
- Tug Murrell—
  - Barge Emelie, N. E. C. & C. Co 1,069
  - Barge Bessie, N. E. C. & C. Co 640

Steamed, steamer Grecian for Baltimore, Mer. & Min. T. Co 2,827

Highland Light, wind 5 p. m., WNW., moderate breeze, clear, smooth sea:
- Passed east—
  - Tug Carlisle—
    - Barge Robesonia, Reading R. R 955
    - Barge Oak Hill, Reading R. R 910
    - Barge Rutherford, Reading R. R 955
- Passed west—
  - Tug Valley Forge—
    - Barge Eagle Hill, Reading R. R 911
    - Barge Tabor 963
    - Barge Bear Ridge 910

Nobska, wind NW., 14 miles, smoky.
Vineyard Haven, wind W., moderate breeze, clear, smooth sea:
Arrived west—
Schooner James Slater..... 311
Schooner C. M. Walter (Br.)..... 154
Passed east—
Steamer John G. McCullough..... 1,895
Schooner Rebecca R. Douglass..... 475
Passed west—
Tug W. S. Taylor, towing 3 barges..... 2,400
Tug North American, towing 2 barges..... 1,600

In canal:		Around cape:	
Steamers	3	Steamers	5
Tugs	2	Tugs	6
Barges	7	Barges	16
Schooners	3	Schooners	3
Total	15	Total	30
Tonnage, estimated	15,698	Tonnage, estimated	27,526

Tug Western, barges Forrist Belle, Sidney, and Smyrna were at Nobska November 17. Left November 20.
Schooner F. C. Pendleton arrived at Vineyard Haven November 13. Sailed November 20.

NOVEMBER 21, 1916.

Passed east:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Steamer Old Colony, Eastern S. S. Co..... 4,779
Tug Mercury, towing 2 barges..... 1,600
Tug Jos. R'Riorden, towing 2 barges..... 1,600
Schooner Priscilla (Br.)..... 135
Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Steamer America, Great Nor. P. Co..... 1,205
U. S. destroyer Reid..... 700
Schooner Flora Condon..... 230
Schooner Mary Olys..... 224
Tug Standard No. 11, towing 2 barges..... 1,600

BOSTON.

Arrived:
Steamer Kershaw from Norfolk, Mer. & Min. T. Co..... 2,599
Steamer Bay View from Newport News, White Oak T. Co..... 1,399
Steamed:
Steamer Bristol for Norfolk..... 284
Steamer City of Glasgow for New York.....
Steamer Nantucket for Norfolk, Mer. & Min. T. Co..... 2,599
Steamer Dorchester for Philadelphia, Mer. & Min. T. Co..... 2,537
Steamer Newton for Sewalls Point, N. E. C. & C. Co..... 5,194
Steamer Everett for Lamberts Point, N. E. C. & C. Co..... 5,107
Steamer Meteor for Newport News, Pac. Coast S. S. Co..... 2,301
Steamer Nacoochie for Savannah, Ocean S. S. Co..... 2,680
Steamer Harvey H. Brown for Newport News..... 2,673
Steamer Inland for New York.....
Tug, Tacony—
Barge Malvern, Sus. Coal Co..... 844
Barge Nanticoke, Sus. Coal Co..... 771
Barge Radnor, Sus. Coal Co..... 678
Highland Light, wind 5 p. m., NE., 12 miles, clear, rough sea.
Nobska, wind NE. 12 miles, fair:
Passed west, steamer Joancy.....

Vineyard Haven:
- Arrived west, schooner Mount Hope 1,105
- Arrived east—
  - Tug Paoli—
    - Barge Upton, Sus. Coal Co 843
    - Barge Strafford, Sus. Coal Co 678
    - Barge Oxford, Sus. Coal Co 836
  - Tug Sea King, barge Nanticoke, Scully T. Co 730
- Arrived west—
  - Schooner William Booth 545
  - Schooner Thos. H. Lawrence 374
  - Tug Germantown—
    - Barge Phoenix, Reading R. R 901
    - Barge Molino 954
    - Barge Skippack 739

In canal:		Around cape:	
Steamers	4	Steamers	13
U. S. destroyer	1	Tugs	4
Tugs	3	Barges	10
Barges	6	Schooners	3
Schooners	3		
Total	17	Total	30
Tonnage, estimated	21,631	Tonnage, estimated	37,371

NOVEMBER 22, 1916.

Passed east, barge Ballemore, Boston T. B. Co 750
Passed west:
- Tug Nottingham—
  - Barge No. 14, L. & W. C. Co 953
  - Barge No. 15, L. & W. C. Co 953
  - Barge Wilkes-Barre, L. & W. C. Co 1,678
- Schooner Centennial 115
- Schooner Maud S 79
- Schooner Susan N. Pickering 336
- Schooner Oakes Ames 254
- Schooner Jessie Hart 2 255
- Schooner Carrie Bucknam 287
- Schooner Wesley Abbott 144

Passed east, steamer Massachusetts 4,779
Passed west, steamer Old Colony 4,779

BOSTON.

Arrived:
- Steamer Ontario from Baltimore, Mer. & Min. T. Co 3,099
- Steamer Cretan from Philadelphia, Mer. & Min. T. Co 2,350
- Tug May—
  - Barge Elizabeth 288
  - Barge Calvin 415
- Tug Albatross, barge Wilmington 178
- Tug Essex—
  - Barge Cohocton 671
  - Barge Easton 830

Steamed:
- Steamer Newton for Sewalls Point, N. E. C. & C. Co 5,194
- Steamer Kershaw for Baltimore, Mer. & Min. T. Co 2,599
- Tug Luckenbach—
  - Barge City of Washington, Luck. S. S. Co 2,410
  - Barge San Joaquin, Luck. S. S. Co 1,551
- Tug Albatross 286
- Tug DeWitt C. Ivins—
  - Barge Dunmore 700
  - Barge Newark 313
- Tug Murrell—
  - Barge Portsmouth 1,159
  - Barge Providence 1,159

Highland Light, wind 5 p. m., 15 miles, clear, smooth sea:
Passed east, schooner Rebecca R. Douglass..... 475
Chatham, wind 5 p. m., SW., fresh breeze, clear:
Passed east, steamer Northland, Eastern S. S. Co..... 3,282
Passed west—
Tug Standard, barge No. 57, Standard T. Co..... 1,381
Tug Patience—
Barge C. F. Pritchard, F. W. Munn Co..... 861
Barge Reading, F. W. Munn Co..... 1,283
Barge Harrisburg, F. W. Munn Co..... 1,283
Passed east—
Tug Ontario—
Barge Ellenville, N. Y. O. & W. R. R..... 858
Barge Metacomet, N. Y. O. & W. R. R..... 852
Barge Pilgrim, N. Y. O. & W. R. R..... 1,215
Nobska, wind 4.40 p. m., W., 18 miles, fair:
Passed west—
Steamer Coastwise, Coastwise S. S. Co..... 4,015
Steamer H. F. Dimock, Eastern S. S. Co..... 2,625
Vineyard Haven, wind SW., fresh, choppy sea, clear:
Arrived and sailed, east—
Schooner J. N. Rafuse (Br.).....
Tug Westerly..... 68

In canal:		Around cape:	
Steamers	2	Steamers	7
Tugs	1	Tugs	11
Barges	4	Barges	18
Schooners	7	Schooners	2
Total	14	Total	38
Tonnage, estimated	15,362	Tonnage, estimated	41,400

NOVEMBER 23, 1916.

Passed east:
Schooner Lillian..... 129
Barge Brockton, Staples T. Co..... 567
Steamer Old Colony, Eastern S. S. Co..... 4,779
Passed west:
Tug Thos. Yorke, scow No. 34..... 300
Tug De Witt C. Ivans—
Barge Dunmore..... 581
Barge Newark..... 265
Steam lighter Cornelia, Boston Land & G. Co..... 285
Schooner Emily F. Northam..... 332
Barge Ida Woods, James Hughes..... 524
Barge Sharon, James Hughes..... 414
Steamer Bunker Hill, Eastern S. S. Co..... 4,779

BOSTON.

Arrived:
Steamer Brandon, from Baltimore, N. E. C. & C. Co..... 2,431
Steamer Powhattan, from Baltimore, Mer. & Min. T. Co..... 2,898
Steamed:
Steamer Ontario, for Norfolk, Mer. & Min. T. Co..... 3,099
Steamer Cretan, for Philadelphia, Mer. & Min. T. Co..... 2,350
Steamer Melrose, for Sewalls Point, N. E. C. & C. Co..... 5,107
Steamer Bay View, for Newport News, White Oak T. Co..... 1,399
Highland Light, wind 5 p. m. SW., 18 miles, thick and raining, smooth sea:
Passed west, steamer Transportation (supposed), Coastwise S. S. Co..... 4,015
Chatham, 5 p. m. wind S., strong breeze, thick and raining:
Passed east, tug Lykens—
Barge Logan, Reading R. R..... 955
Barge Neshaming, Reading R. R..... 721
Barge Marion, Reading R. R..... 954

Vineyard Haven, p. m. wind SW., fresh, choppy sea, thick and raining:
Arrived east—
Steamer Binghamton..... 1,462
Tug Standard, barge No. 124, S. T. Co..... 952
Tug Gypsum King, towing 3 barges, J. B. King Co..... 3,300

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	2	Tugs	3
Barges	5	Barges	7
Scows	1		
Steam lighter	1	Total	18
Schooners	2		
Total	13	Tonnage, estimated	29,643
Tonnage, estimated	12,955		

NOVEMBER 24, 1916.

Passed east:
Tug Standard, barge 124, Standard T. Co..... 952
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Passed west:
Steamer Old Colony, Eastern S. S. Co..... 4,779
Steamer Jas. S. Whitney, Eastern S. S. Co..... 2,707
Barge Helen Woods, Jas. Hughes..... 505

BOSTON.

Arrived:
Steamer Tuscan, from Baltimore, Mer. & Min. T. Co..... 2,415
Steamer Indian, from Philadelphia, Mer. & Min. T. Co..... 2,110
Steamer City of Atlanta, from Savannah, Ocean S. S. Co..... 5,433
Steamer Walter D. Noyes, from Sewalls Point.....
Steamed:
Steamer Hampden, for Baltimore, Coastwise S. S. Co..... 4,725
Steamer Powhattan, for Baltimore, Mer. & Min. T. Co..... 2,898
Steamer Bay Port, for Sewalls Point, White Oak T. Co..... 1,399
Steamer Marianna, for New York, N. Y. & Porto Rico Co..... 3,063
Tug Carlisle—
Barge Paxtona, Reading R. R..... 954
Barge Cacoosing, Reading R. R..... 721
Barge Henry Clay, Reading R. R..... 841
Highland Light, wind 4.30 p. m. W., 30 miles, cloudy, smooth sea:
Passed west—
Tug Calvert—
Barge R. & R. L. Co. No. 1, R. & R. L. Co..... 1,120
Barge R. & R. L. Co. No. —, R. & R. L. Co..... 1,120
Bay View, White Oak T. Co..... 1,399
Chatham, wind 5 p. m. W., strong breeze, clear:
Passed east, steamer H. F. Dimok, Eastern S. S. Co..... 2,625
Nobska, wind 5 p. m. W., 30 miles, clear:
Passed east. tug Boxer—
Barge Hampshire, F. W. Munn Co..... 830
Barge Glendower, Reading R. R..... 855
Barge Bast, Reading R. R..... 693
Vineyard Haven, wind 5 p. m. W., 30 miles, clear:
Steamed west, steamer Melrose..... 5,107
Steamed east—
Tug North America—
Barge Chemung, C. W. Chadwick..... 671
Barge R. & R. L. Co., C. W. Chadwick..... 1,120
Barge R. & R. L. Co. No. 5, C. W. Chadwick..... 1,120
Tug Wyoming—
Barge No. 702, Lehigh Valley..... 934
Barge No. 708, Lehigh Valley..... 900
Barge No. 740, Lehigh Valley..... 800
Tug Luckenbach, Luck S. S. Co.....

In canal:	
Steamers	3
Tugs	1
Barges	2
Total	6
Tonnage, estimated	13,772

Around cape:	
Steamers	11
Tugs	6
Barges	14
Total	31
Tonnage, estimated	44,153

Boston, November 24.—An examination of steamer Chippewa revealed damaged plates for about 100 feet in her bottom. The contract for repairs was awarded to Tietjen & Lang Dry Dock Co. (Hoboken), and steamer will leave for New York to-morrow.

NOVEMBER 26, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Steamer America, Great Nor. P. Co. 1,205
- Tug Honeybrook, towing 3 barges, L. & W. Coal Co. 1,900
- Barge S. T. Co., No. 62, Stand. T. Co. 1,200
- Barge Albany, Keller T. Co. 659
- Schooner Neva (Br.) 191
- Schooner F. G. French (Br.) 175

Passed west:
- Tug S. T. Co. No. 2, barge No. 123 1,400
- Tug Jos. O'Riorden—
  - Barge Albany 659
  - Barge John Boyle 436
- Tug Mercury, barge Svaland 400
- Lighter Salvor 180
- Lighter Wm. H. Moody Lighter No. 1 259
- Steamer H. M. Whitney 2,706
- Steamer Bunker Hill, Eastern S. S. Co. 4,779

BOSTON.

Arrived:
- Tug Chas. P. Greenough—
  - Barge Grace, N. E. C. & C. Co. 877
  - Barge Hattie 1,286
- Tug Concord, barge Chatham, Staples T. Co. 1,812
- Steamer Dorchester from Philadelphia, Mer. & Min. T. Co. 2,537
- Steamer J. H. Devereux from Philadelphia, Metro. Coal Co 1,618
- Steamer Nantucket from Norfolk, Mer. & Min. T. Co. 2,599

Steamed:
- Steamer Tuscan for Norfolk, Mer. & Min. T. Co. 2,415
- Steamer Indian for Philadelphia, Mer. & Min. T. Co. 2,110
- Steamer Dorothy for Newport News
- Steamer City of Augusta for Savannah, Ocean S. S. Co. 5,433
- Steamer Brandon for Baltimore
- Steamer Rio Grande for Jacksonville, Clyde S. S. Co. 2,556
- Tug Ontario—
  - Barge Smyrna, N. Y. O. & W. R. R. 741
  - Barge Metacomet, N. Y. O. & W. R. R. 800
  - Barge Cadosia, N. Y. O. & W. R. R. 756

Vineyard Haven, wind NW., fresh, choppy sea, clear:
- Passed west—steamer Hewitt
- Passed east—
  - Tug International, towing 3 barges, Reading R. R. 2,400
  - Tug Catawissa, towing 3 barges, Reading R. R. 2,400
- Sailed east—schooner Harry W. Lewis (Br.) 200

In canal:	
Steamers	4
Tugs	4
Barges	8
Motor barge	1
Schooners	2
Lighters	3
Total	22
Tonnage, estimated	20,928

Around cape:	
Steamers	10
Tugs	5
Barges	12
Schooners	1
Total	28
Tonnage, estimated	30,540

NOVEMBER 27, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Tug, S. T. Co., No. 2—
  - Barge No. 5, Standard T. Co 800
  - Barge No. 86 1,102
- Schooner J. Howell Leeds 414
- Schooner Edith McIntyre 160
- Schooner Brigadier 310
- Schooner Lizzie J. Call 206

Passed west: Steamer Massachusetts, Eastern S. S. Co 4,779

BOSTON.

Arrived:
- Steamer City of Augusta from Savannah, Ocean S. S. Co 2,869
- Steamer Mae from Norfolk, Jas. W. Ellwell & Co 2,103
- Steamer Grecian from Baltimore, Mer. & Min. T. Co 2,827
- Tug Monocacy—
  - Barge Maple Hill, Reading R. R 911
  - Barge Wiconisco, Reading R. R 956
- Tug Boswell, Barge Flora, N. E. C. & C. Co 865
- Tug Germantown—
  - Barge Suffolk, Reading R. R 855
  - Barge Tamenend, Reading R. R 721
  - Barge Leesport, Reading R. R 963

Steamed:
- Steamer Walter D. Noyes for Sewalls Point .....
- Steamer Arlington for Baltimore, N. E. C. & C. Co 2,431
- Steamer Nantucket for Baltimore, Mer. & Min. T. Co 2,599
- Steamer Malden for Lamberts Point, N. E. C. & C. Co 5,107
- Tug Essex—
  - Barge Pequest, C. W. Chadwick 843
  - Barge Coaldale, C. W. Chadwick 831
  - Barge Lansford, C. W. Chadwick 830
- Tug Mex. Pet—
  - Barge M. P. Co. No. 2, Mex. Pet. Co 800
  - M. P. Co. No. 3 800
- Tug Sea King—
  - Barge Cohocton, C. W. Chadwick 671
  - Barge Panther Creek, C. W. Chadwick 739
- Tug May—
  - Barge Calvin 415
  - Barge Elizabeth 440
- Tug Monocacy—
  - Barge Manheim, Reading R. R 955
  - Barge Lincoln, Reading R. R 855
  - Barge Hammond, Reading R. R 693
- Tug Paoli—
  - Barge Oxford, Sus. Coal Co 836
  - Barge Shamokin, Sus. Coal Co 829
  - Barge Strafford, Sus. Coal Co 678

Highland Light, wind 5 p. m. SW., 35 miles, clear, smooth sea.
Chatham, wind 5 p. m. SW., strong breeze, clear:
Passed east:
- Tug Lehigh—
  - Barge 766, Lehigh Valley R. R 600
  - Barge 783, Lehigh Valley R. R 923
  - Barge 792, Lehigh Valley R. R 600
- Tug Georges Creek—
  - Barge No. 7, Con. Coal Co 898
  - Barge No. 20 940
  - Barge No. 25 1,566
- Tug John Scully, barge I. F. Chapman, Scully T. Co 2,146

Nobska:
- Passed west, steamer Bay View, White Oak T. Co 1,399

Vineyard Haven, westerly gale, rough sea, cloudy:
Arrived, west, steamer Glenmount (Br.) 1,957
Steamed east—
Tug Triton—
Barge Geo. R. Skolfield, Seaboard T. Co 1,728
Barge Idaho 1,376
Steamed west—
Tug Luckenbach No. 4—
Barge City of Washington, Luck. S. S. Co 2,410
Barge San Joanquin, Luck. S. S. Co 1,551

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	1	Tugs	14
Barges	2	Barges	32
Schooners	4		
Total	9	Total	55
Tonnage, estimated	12,550	Tonnage, estimated	52,516

Tug Boxer with 3 barges passed Nobska November 24; arrived Boston November 27.
Tug North America with 3 barges passed Vineyard Haven November 24; arrived Boston November 27.

NOVEMBER 28, 1916.

Passed east:
Schooner Abenaki 176
Schooner W. R. Perkins 178
Schooner Calvin P. Harris 465
Schooner Ida Gibson 235
Lighter Salvor 180
Steamer Massachusetts, Eastern S. S. Co 4,779
Passed west:
Tug. Mex. Pet.—
Barge 2, Mex. Pet. Co 750
Barge 3 750
Tug May—
Barge Calvin, Pettinos Bros 415
Barge Elizabeth, Pettinos Bros 440
Tug Eastern—
Barge Cullen No. 15, N. Y. & Boston T. Co 406
Barge Electra, N. Y. & Boston T. Co 486
Barge Haber, N. Y. & Boston T. Co 420
Tug Cheektowaga, towing 3 barges, Lehigh Valley 2,400
Tug Honeybrook, towing 3 barges 2,400
Tug John A. Hughes, barge Magnolia 600
Schooner Wm. D. Hilton 324
Schooner Henrietta Whitney 217
Steamer Bunker Hill 4,779

BOSTON.

Arrived:
Steamer Selwyn Eddy from Norfolk 2,846
Steamer Ontario from Baltimore, Mer. & Min. T. Co 3,099
Steamer Bay State from Sewalls Point, White Oak T. Co 1,245
Steamer Norfolk from Norfolk, Coastwise S. S. Co 3,521
Tug Gettysburg—
Barge Pennypack, Reading R. R 739
Barge Tabor, Reading R. R 963
Barge Indian Ridge, Reading R. R 910
Steamed:
Steamer Nantucket for Norfolk, Mer. & Min. T. Co 2,599
Tug Edw. Luckenbach for New York .....
Steamer Grecian for Norfolk, Mer. & Min. T. Co 2,537
Steamer Dorchester for Philadelphia 2,827
Steamer Everett for Newport News, N. E. C. & C. Co 5,107
Steamer City of Augusta for Savannah, Ocean S. S. Co 2,869
Steamer Corsica for Norfolk 368
Steamer J. H. Devereux for Philadelphia 1,618

Steamed—Continued.
Tug Luckenbach No. 1—
Barge Solitaire..... 1,515
Barge J. B. Walker..... 2,136
Barge West Point..... 1,213
Tug North America—
Barge R. & R. L. Co. No. 4..... 1,120
Barge R. & R. L. Co. No. 5..... 1,120
Tug Boxer—
Barge Buck Ridge, Reading R. R..... 915
Barge Mahoney, Reading R. R..... 855
Barge Merriam, Reading R. R..... 855
Highland Light, wind 5 p. m. SW., 20 miles, cloudy, smooth sea.
Vineyard Haven, wind SW., fresh, choppy sea, cloudy:
Steamed west—
Tug Calvert—
Barge R. & R. L. Co. No. 1..... 1,120
Barge R. & R. L. Co. No. 6..... 1,120
Tug International—
Barge Langhorne..... 955
Barge Kimberton..... 955
Steamed east, motor barge Dan'l M. Munroe (Br.)..... 800

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	6	Tugs	7
Barges	14	Barges	15
Schooners	6	Motor barge	1
Lighter	1		
Total	29	Total	34
Tonnage, estimated	20,400	Tonnage, estimated	45,727

NOVEMBER 30, 1916.

Passed east:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Steamer Black Rock..... 1,997
Tug Juniata, barge Caddo, Texas Oil Co..... 432
Tug Standard barge No. 6, Standard Oil Co..... 800
Tug Standard barge No. 57, Standard Oil Co..... 1,381
Schooner Chas. L. Jeffrey..... 348
Barge A. G. Townes..... 700
Passed west:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Steamer H. M. Whitney, Eastern S. S. Co..... 2,706
Steamer America, Great Nor. Paper Co..... 1,205
Tug S. T. Co. No. 2—
Barge 5, Standard T. Co..... 700
Barge 86, Standard T. Co..... 1,102
Barge 4, Standard T. Co..... 700

BOSTON.

Arrived, steamer Tuscan from Norfolk, Mer. & Min. T. Co..... 2,415
Steamed:
Steamer Coofe Castle (Br.) for N. Y..... 4,592
Steamer Kershaw for Norfolk, Mer. & Min. T. Co..... 2,599
Steamer Norfolk for Norfolk, Coastwise S. S. Co..... 3,521
Steamer Cretan for Philadelphia, Mer. & Min. T. Co..... 2,350
Steamer Bay State for Newport News, White Oak T. Co..... 1,245
Steamer Jean for Hampton Roads, A. H. Bull S. S. Co..... 3,125

Vineyard Haven, wind S., fresh, choppy, p. m., thick and raining:
Arrived west—
Tug Lehigh—
Barge No. 780, Lehigh Valley R. R 926
Barge No. 788, Lehigh Valley R. R 700
Barge No. 766, Lehigh Valley R. R 650
Tug Georges Creek—
Barge No. 10, Con. Coal Co 897
Barge No. 15, Con. Coal Co 912
Barge No. 19, Con. Coal Co 932
Arrived east—
Schooner Unique (Br.) 107
Schooner Lena F. Oxner (Br.) 200
Passed west, tug Concord, towing 2 barges 1,200
Passed east, schooner Fred B. Balano 263
Sailed west, schooner B. H. Warford 203

In canal:		Around cape:	
Steamer	5	Steamers	7
Tugs	3	Tugs	3
Barges	7	Barges	8
Schooner	1	Schooners	4
Total	16	Total	22
Tonnage, estimated	21,629	Tonnage estimated	26,837

DECEMBER 1, 1916.

Arrived, tug Mercury towing 2 barges, Boston T. B. Co 1,600
Passed west:
Steamer Shawmut, Clyde S. S. Co 1,624
U. S. submarine 700
Steamer Massachusetts, Eastern S. S. Co 4,779
Passed east, steamer Bunker Hill, Eastern S. S. Co 4,779

BOSTON.

Arrived:
Steamer Macoochee from Savannah, Ocean S. S. Co 2,680
Steamer Indian from Philadelphia, Mer. & Min. T. Co 2,110
Steamer Powhatan from Baltimore, Mer. & Min. T. Co 2,898
Tug John Scully, barge Gov. Robie 1,712
Steamed, steamer Tuscan for Baltimore, Mer. & Min. T. Co 2,415
Highland Light, wind 5 p. m., NNW., 20 miles, clear, sea moderating:
Passed west, tug Triton—
Barge Coastwise, Seaboard T. Co 1,000
Barge Kentucky, Seaboard T. Co 1,575
Nobska, wind NNE., 15 miles, clear:
Passed west, steamer Ruth, A. H. Bull S. S. Co 3,102
Vineyard Haven: Passed west, steamer Binghamton 1,462

In canal:		Around cape:	
Steamers	3	Steamers	6
Tug	1	Tugs	2
Barges	2	Barges	3
Submarine	1	Total	11
Total	7	Tonnage, estimated	18,954
Tonnage, estimated	13,482		

Steamers H. F. Dimock of the Eastern S. S. Co. and steamer Katahdin, Clyde Line, arrived Boston, probably passed through canal. Herald does not report regular liners as passing through canal, if such liners have arrived at destination.

Boston—Steamer Howard reports 9.55 a. m. to-day about a mile north of Pollock Rip Slue. L. S. passed schooner Fred B. Delano from Cartaret for Lubec running back toward Vineyard Haven with jib and spanker blown to pieces.

DECEMBER 3, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Steamer St. Paul, U. S. S. Co. 2,029
- Steamer H. M. Whitney, Eastern S. S. Co. 2,706
- Schooner Hannah H. 71

Passed west:
- Steamer H. F. Dimock, Eastern S. S. Co. 2,625
- Tug Nottingham, towing 3 barges, L. & W. Co. 2,400
- Barge Allen No. 15, N. Y. & B. T. Co. 406
- Barge Shadyside, N. Y. & B. T. Co. 405
- Barge Lake Michigan, N. Y. & B. T. Co. 400
- Schooner Emma McAdam 166
- Schooner Sarah and Lucy 252
- Schooner Mame Saunders 279

BOSTON.

Arrived:
- Steamer Grecian from Norfolk, Mer. & Min. T. Co. 2,827
- Steamer Dorchester from Philadelphia, Mer. & Min. T. Co. 2,537
- Steamer Walter D. Noyes from Newport News.
- Steamer Plymouth 373
- Tug Chas. W. Parker, jr.—
  - Barge Helen, N. E. C. & C. Co. 1,285
  - Barge Irene, N. E. C. & C. Co. 1,206
  - Barge Potomac, N. E. C. & C. Co. 823
- Tug Sea King—
  - Barge Nequeshoning, L. C. & N. Co. 967
  - Barge R. & R. L. Co. No. 3, R. & R. L. Co. 1,120
  - Barge Pohatcong, C. W. Chadwick 843

Steamed:
- Steamer Mae for Norfolk, Jas. W. Elwell Co. 2,103
- Steamer Bay State for Newport News, White Oak T. Co. 1,245
- Steamer City of Durham (Br.) for New York
- Steamer Absolon (Dan.) for Newport News
- Steamer Senator (Nor.) for New York 995
- Steamer Nacoochee for Savannah, Ocean S. S. Co. 2,680
- Steamer Brandon for Baltimore

Vineyard Haven, wind W., moderate, smooth sea, clear:
- Steamed east—
  - Tug Paoli—
    - Barge Devon, Sus. Coal Co. 724
    - Barge Radnor, Sus. Coal Co. 678
    - Barge Haverford, Sus. Coal Co. 678
  - Tug Western—
    - Barge Smyrna, N. Y. O. & W. R. R. 741
    - Barge Sidney 745
    - Barge Forest Belle 1,333
- Steamed west, Tug Lehigh—
  - Barge 780, Lehigh Valley R. R. 926
  - Barge 788, Lehigh Valley R. R. 650
  - Barge 766, Lehigh Valley R. R. 650
- Arrived west—
  - Schooner Geo. E. Klinck 560
  - Tug North America, Barge R. & R. L. Co. No. 7 (2 others), R. & R. L. Co. 3,360

In canal:		Around cape:	
Steamers	4	Steamers	11
Tugs	1	Tugs	6
Barges	6	Barges	18
Schooners	4	Schooners	1
Total	15	Total	36
Tonnage, estimated	16,518	Tonnage, estimated	30,049

DECEMBER 4, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Steamer C. B. Sanford
- Tug S. T. Co. No. 2—
  - Barge 123, Standard T. Co. 900
  - Barge 124, Standard T. Co. 952
- Barge Hatteras, C. W. Chadwick & Co. 788
- Barge Eugenia Hooper 730
- Barge Binghamton, Keller T. Co. 588
- Barge Passaic, Keller T. Co. 875
- Barge Scranton, Keller T. Co. 489
- Schooner Ernest Thee 173

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Steamer Bay State, White Oak T. Co. 1,245
- Barges S. T. Co. No. 2 700
- Barge Kenneth McNeil 578

BOSTON.

Arrived:
- Steamer City of Atlanta from Savannah, Ocean S. S. Co. 5,433
- Steamer Huron from Newport News 1,945
- Steamer Middlesex from Norfolk, Coastwise T. Co. 4,727
- Steamer Arlington from Baltimore, N. E. C. & C. Co. 2,431
- Steamer Nantucket from Baltimore, Mer. & Min. T. Co. 2,599
- Steamer Boston from New York 4,184
- Tug Monocacy—
  - Barge Bear Ridge, Reading R. R. 910
  - Barge Enterprise, Reading R. R. 901
  - Barge Brookside, Reading R. R. 841

Steamed:
- Steamer Hampden for Baltimore, Coastwise S. S. Co. 4,725
- Steamer Melrose for Newport News, N. E. C. & C. Co. 5,107

Highland Light, wind 5 p. m. SW., cloudy, smooth sea:
- Passed west—
  - Steamer Malden, N. E. C. & C. Co. 5,107
  - Steamer Grecian 2,827
- Passed east, Steamer Newton, N. E. C. & C. Co. 5,194

Nobska, wind 5 p. m. S., 25 miles, cloudy.

Vineyard Haven, wind S., fresh breeze, cloudy, choppy sea:
- Arrived east, Tug Calvert—
  - Barge Carristeo, C. W. Chadwick 671
  - Barge Allentown, C. W. Chadwick 842
  - Barge Hopatcong, C. W. Chadwick 800
- Passed west, steamer Eastgate (Br.)
- Passed east, steamer Socony towing 1 barge, Standard T. Co 800
- Passed west, schooner Jacksonville 620

In canal:		Around cape:	
Steamers	4	Steamers	13
Tugs	1	Tugs	2
Barges	9	Barges	7
Schooners	1	Schooners	1
Total	15	Total	23
Tonnage, estimated	17,576	Tonnage, estimated	50,664

DECEMBER 5, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Schooner Sallie E. Ludlam 237
- Schooner Fred B. Belano 263

Passed west:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Tug S. T. Co. No. 2, barge No. 6, Standard T. Co. 800
- Tug Juniata, barge Caddo, Texas Oil Co. 432

BOSTON.

Arrived:
- Steamer Kershaw, from Norfolk, Mer. & Min. T. Co 2,599
- Steamer Everett, from Newport News, N. E. C. & C. Co 5,129
- Steamer Gulfaxe (Dan.), from Jucaro via Norfolk .....
- Steamer Corsica, from Norfolk 368

Steamed:
- Steamer Katahdin, for Jacksonville, Clyde S. S. Co 2,696
- Tug Piedmont—
  - Barge No. 14, Con. Coal Co 927
  - Barge No. 21, Con. Coal Co 905
  - Barge No. 25, Con. Coal Co 1,566
- Steamer Dorchester, for Philadelphia, Mer. & Min. T. Co 2,537
- Steamer Nantucket, for Norfolk, Mer. & Min. T. Co 2,599
- Steamer Newton, for Sewalls Point, N. E. C. & C. Co 5,194
- Steamer Walter D. Noyes, for Newport News .....
- Steamer City of Atlanta for Savannah, Ocean S. S. Co 5,433

Highland Light, wind, 5 p. m., SW., 20 miles, cloudy, smooth:
- Passed tug Chas. W. Parker, jr., barge Grace, for New Bedford, N. E. C. & C. Co 877

Chatham, 5 p. m., wind S., fresh breeze, cloudy and hazy:
- Passed east, tug Carlisle—
  - Barge Paxtang, Reading R. R 954
  - Barge Skippack, Reading R. R 739
  - Barge Cacoosing, Reading R. R 721
- Passed west, tug Lenape—
  - Barge Rutherford, Reading R. R 955
  - Barge Cleona, Reading R. R 956

Nobska, 2.27 p. m., wind SW., 9 miles, partly cloudy:
- Passed east, steamer Transportation, Coastwise S. S. Co 4,105

Vineyard Haven:
- Arrived east, tug Luckenbach No. 3, barge General, Knox-Luck S. S. Co. 1,587
- Arrived west, tug W. S. Taylor—
  - Barge Rahn, C. W. Chadwick 932
  - Barge Greenwood, C. W. Chadwick 967
  - Barge Hauto, C. W. Chadwick 830
- Passed east, steamer Joancy .....

In canal:		Around cape:	
Steamers	2	Steamers	12
Tugs	2	Tugs	6
Barges	2	Barges	13
Schooners	2		
Total	8	Total	31
Tonnage, estimated	11,290	Tonnage, estimated	43,486

Steamer Howard reported at 9.55 a. m., December 1, about a mile north of Pollock Rip Slue, passed Schooner Fred. B. Belano running back to Vineyard Haven with jib and spanker blown to pieces. This schooner passed east through canal December 5.

DECEMBER 6, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co 4,779
- Steamer H. F. Dimock, Eastern S. S. Co 2,625
- Tug Honeybrook, towing 3 barges, L. & W. C. Co 2,500

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Steamer St. Paul, U. S. S. S. Co 2,029
- Steamer Minneapolis, U. S. S. S. Co 2,029
- Steamer H. M. Whitney, Eastern S. S. Co 2,706

Passed east, tug Neponsit, towing 1 barge 800

BOSTON.

Arrived:
- Steamer Ontario, from Baltimore, Mer. & Min. T. Co. 3,099
- Steamer Cretan, from Philadelphia, Mer. & Min. T. Co. 2,350
- Steamer Bristol, from Norfolk, 284

Steamed:
- Steamer Kershaw, for Baltimore, Mer. & Min. T. Co. 2,599
- Steamer Arlington, for Newport News, N. E. C. & C. Co. 2,431
- Steamer Norwega (Nor.), for Newport News
- Tug Socony, barge No. 90, Stand. T. Co. 2,451
- Steamer Corsica, for Norfolk 368
- Steamer Middlesex, for Norfolk, Coastwise S. S. Co. 4,727
- Steamer Plymouth, for Baltimore 373
- Tug Western—
  - Barge Ellenville, N. Y., O. & W. R. R. 858
  - Barge Pilgrim, N. Y., O. & W. R. R. 1,215
  - Barge Smyrna, N. Y., O. & W. R. R. 741
- Tug Carlisle—
  - Barge Cocalico, Reading R. R. 956
  - Barge Boston, Reading R. R. 1,159
  - Barge Glendower, Reading R. R. 855

Highland Light, wind, 5 p. m., NW., 37 miles, partly cloudy, choppy sea:
- Passed east, steamer Rosemount (Br.) 1,580

Chatham, wind, 5 p. m., NNW., strong breeze, cloudy:
- Passed east—
  - Tug Standard II, barge S. T. Co. No. 5, Stand. T. Co. 800
  - Tug Patience, barge Reading (2 other barges), F. W. Munn 1,100

Nobska:
- Passed east, tug Gypsum King, towing barge, J. B. King Co. 900

Vineyard Haven, wind NW, heavy, rough sea, clear:
- Arrived east—
  - Schooner C. M. Walters, N. E. C. & C. Co. 200
  - Tug Gwalia—
    - Barge Biwabik, N. E. C. & C. Co. 1,401
    - Barge Annie, N. E. C. & C. Co. 1,098
    - Barge R. W. McDonald, N. E. C. & C. Co. 800
  - Tug Murrell—
    - Barge Providence, N. E. C. & C. Co. 1,159
    - Barge Portsmouth, N. E. C. & C. Co. 1,159
    - Barge Clara, N. E. C. & C. Co. 828
  - Steamer Ruth, A. H. Bull S. S. Co. 3,102
  - Schooner Wawenock 325

Woods Hole:
- Arrived east, Tug Swatara—
  - Barge Henry Clay, Reading R. R. 841
  - Barge Manheim, Reading R. R. 955
  - Barge Oley, Reading R. R. 1,780

In canal:		Around cape:	
Steamers	6	Steamers	11
Tugs	2	Tugs	9
Barges	4	Barges	21
		Schooners	2
Total	12	Total	43
Tonnage, estimated	22,247	Tonnage, estimated	44,094

DECEMBER 7, 1916.

Passed east:
- Steamer Bunker Hill 4,779
- Steamer Jas. S. Whitney 2,707
- Tug Mercury, towing 2 barges 1,600
- Schooner Alaska 173

Passed west:
- Steamer Massachusetts 4,779
- Steamer H. F. Dimock 2,625

BOSTON.

Arrived:
- Steamer J. H. Devereux from Philadelphia, Metro Coal Co..... 1,618
- Steamer Powhattan from Norfolk, Mer. & Min. T. Co..... 2,898

Steamed:
- Steamer Cretan for Philadelphia, Mer. & Min. T. Co..... 2,350
- Steamer Ontario for Norfolk, Mer. & Min. T. Co..... 3,099
- Steamer Everett for Newport News, N. E. C. & C. Co..... 5,107
- Steamer Oregon for Philadelphia..... 831

Highland Light, wind 5 p. m. NW., 34 miles, clear, smooth sea.

Chatham, wind 5 p. m., gale, clear:
- Anchored off Handkerchief; east, Steamer Selwyn Eddy..... 2,846

Nobska, wind 1.45 p. m. NW., 17 miles, clear:
- Passed west—
  - Tug Monocacy—
    - Barge Neshaming, Reading R. R..... 967
    - Barge Tamanend, Reading R. R..... 721
    - Barge Preston, Reading R. R..... 855
  - Tug Providence—
    - Barge Baltimore, P. Dougherty..... 600
    - Barge Montauk, P. Dougherty..... 600

Vineyard Haven, wind NW., fresh, choppy sea, clear:
- Arrived east—
  - Tug Lykens—
    - Barge Buck Ridge, Reading R. R..... 915
    - Barge Langhorne, Reading R. R..... 955
    - Barge Paxinos, Reading R. R..... 954
  - Tug Valley Forge—
    - Barge Maple Hill, Reading R. R..... 911
    - Barge Tardley..... 963
    - Barge Macungu..... 956

In canal:		Around cape:	
Steamers	4	Steamers	7
Tugs	1	Tugs	4
Barges	2	Barges	11
Schooners	1		
Total	8	Total	22
Tonnage, estimated	16,663	Tonnage, estimated	28,146

DECEMBER 8, 1916.

Passed west:
- Steamer Mohawk, Clyde S. S. Co..... 4,623
- Barge Baltimore, Boston T. B. Co..... 650
- Barge Pohatcong, C. W. Chadwick..... 843
- Schooner Chas. H. Trickery..... 281
- Schooner Hannah H..... 71
- Steamer Bunker Hill, Eastern S. S. Co..... 4,779

Passed east:
- Steamer Massachusetts, Eastern S. S. Co..... 4,779
- Steamer H. M. Whitney, Eastern S. S. Co..... 2,706
- Tug Checktowaga towing 3 barges, Lehigh Valley R. R..... 2,400
- Tug Neptune, towing 1 barge..... 800

BOSTON.

Arrived:
- Steamer City of Augusta from Savannah, Ocean S. S. Co..... 2,869
- Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
- Steamer Tuscan from Norfolk, Mer. & Min. T. Co..... 2,415
- Steamer Harvey H. Brown from Norfolk..... 2,673
- Steamer Onondaga from Norfolk, Clyde S. S. Co..... 2,696
- Tug Luckenbach, No. 4—
  - Barge Carrie Clark, Luck S. S. Co..... 1,298
  - Barge Josephus, Luck S. S. Co..... 1,406

Steamed:
- Steamer Huron for Newport News..... 1,945
- Steamer Powhattan for Newport News, Mer. & Min. T. Co..... 2,898
- Steamer Cretan for Philadelphia, Mer. & Min. T. Co..... 2,350
- Steamer Corozal for New York, N. Y. & Porto Rico S. S. Co..... 3,063
- Tug Boxer, barge Hampshire, F. W. Munn..... 830
- Tug Paoli—
  - Barge Upton, Sus. Coal Co..... 843
  - Barge Haverford, Sus. Coal Co..... 678
  - Barge Radnor, Sus. Coal Co..... 678

Highland Light, wind 5 p. m. NE., 7 miles, cloudy, smooth sea:
- Passed east, Steamer North Land..... 3,282

Chatham, wind 5 p. m. NE., moderate breeze, partly cloudy:
- Passed west—
  - Tug Standard—
    - Barge S. T. Co. No. 57, Stand. T. Co..... 1,381
    - Barge S. T. Co. No. 123, Stand. T. Co..... 952
    - Barge S. T. Co. No. 124, Stand. T. Co..... 952
  - Passed Shovelful Lightship—
    - Tug Conestoga—
      - Barge Mahoney, Reading R. R..... 855
      - Barge Kimberton..... 955
      - Barge Temple..... 963

Vineyard Haven, wind NE., moderate smooth sea, clear:
- Arrived: Schooner Henry Worthington towing 3 barges, Lehigh Valley.. 527
- Arrived east—
  - Tug Wyoming, towing 3 barges..... 2,400
  - Tug Luckenbach No. 2, towing 2 barges..... 1,800
- Passed east, schooner Wicemin..... 200
- Passed west—
  - Schooner Frances Goodnow..... 358
  - Schooner Flora Condon..... 230

Woods Hole:
- Arrived—
  - Tug Catawissa—
    - Barge Lincoln, Reading R. R..... 855
    - Barge Bethayres, Reading R. R..... 955
    - Barge Tulpehocken..... 721

In canal:		Around cape:	
Steamers	4	Steamers	10
Tugs	2	Tugs	8
Barges	6	Barges	20
Schooners	2	Schooners	4
Total	14	Total	42
Tonnage, estimated	21,932	Tonnage, estimated	46,139

Tug Patience, of F. W. Munn & Co., Philadelphia, with 3 barges, which anchored off Chatham since December 6, proceeded north during the night and returned December 8 for an anchorage.

Schooner Henry Worthington, bound east, broke windlass and lost starboard anchor off Chatham and returned to Vineyard Haven for repairs.

Tug Albert F. Stone (Erie R. R.) sunk in 80 feet of water off Sakonnet Point August 5, was raised yesterday by Merritt & Chapman's derrick Monarch and will be beached to-day on the Sakonnet River.

DECEMBER 10, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co..... 4,779
- Steamer Jas. S. Whitney, Eastern S. S. Co..... 2,707
- Lighter Cornelia, Boston S. & G. Co..... 285
- Steamer Mattie J. Alles..... 229
- Tug S. T. Co. No. 2, barge No. 86, Stand. T. Co..... 1,102

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Steamer H. M. Whitney, Eastern S. S. Co. 2,706
- Steamer J. H. Devereaux, Metro. Coal Co. 1,618
- Tug Augustus, Boston T. B. Co. 67
- Tug Honeybrook—
  - Barge No. 1, L. & W. Coal Co. 852
  - Barge No. 4, L. & W. Coal Co. 685
  - Barge No. 7, L. & W. Coal Co. 685
- Tug Germantown—
  - Barge Brookside, Reading R. R. 841
  - Barge Enterprise, Reading R. R. 901
  - Barge Suffolk, Reading R. R. 855

BOSTON.

Steamed:
- Steamer Onondaga for Charleston, Clyde S. S. Co. 2,696
- Steamer City of Augusta for Savannah, Ocean S. S. Co. 2,869
- Steamer Tuscan for Norfolk, Mer. & Min. T. Co. 2,415
- Steamer Bristol 284
- Steamer Indian for Philadelphia, Mer. & Min. T. Co. 2,110
- Steamer Berkshire for Norfolk. 2,014
- Steamer Selwyn Eddy for Norfolk. 2,846
- Tug Patience—
  - Barge Binghamton, Keller T. Co. 588
  - Barge Scranton, Keller T. Co. 489
  - Barge Passaic, Keller T. Co. 875

Vineyard Haven, wind NW.; fresh breeze; clear; choppy sea:
- Arrived west, schooner Granite (Br.) 200
- Arrived east, steamer Newton, N. E. C. & C. Co. 5,194

In canal:		Around cape:	
Steamers	5	Steamers	8
Tugs	4	Tugs	1
Barges	7	Barges	3
Schooners	1	Schooners	1
Lighters	1		
Total	18	Total	13
Tonnage, estimated	23,091	Tonnage, estimated	22,580

Tug Luckenbach No. 3, with barge Gen. Knox, arrived in the Vineyard December 5; arrived Boston December 10.

Tug Patience, of F. W. Munn & Co., Philadelphia, with 3 barges, anchored off Chatham December 6; arrived in Boston December 10.

DECEMBER 11, 1916.

Passed east:
- Tug Kate Jones 122
- Tug John G. Chandler, barge Iron Queen 1,384
- Tug Atkins Hughes, steamer Vigo 13
- Schooner Lizzie Lane 231
- Schooner Odell 141
- Steamer Bunker Hill, Eastern S. S. Co. 4,779

Passed west:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Steamer H. F. Dimock, Eastern S. S. Co. 2,625
- Schooner Saml. Hart 210
- Schooner Kennebec 187
- Schooner A. F. Kindberg 226
- Schooner Julia Frances 183
- Schooner Elma (Br.) 338
- Tug S. T. Co. No. 2, barge 5, Stand. Trans. Co. 795
- Barge Willia G. Towne 579

BOSTON.

Arrived:
- Steamer Melrose from Newport News, N. E. C. & C. Co. 5,107
- Steamer Dorchester from Philadelphia, Mer. & Min. T. Co. 2,537
- Steamer Nantucket from Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Grecian from Baltimore, Mer. & Min. T. Co. 2,827
- Steamer Matoa from Norfolk 2,311
- Steamer Walter D. Noyes from Newport News. .....
- Steamer Corsica from Norfolk 2,364
- Steamer Nacoochee from Savannah, Ocean S. S. Co. 2,680
- Steamer Malden from Baltimore, N. E. C. & C. Co. 5,107
- Tug Lehigh—
  - Barge No. 780, Lehigh Valley 926
  - Barge No. 785, Lehigh Valley 700
  - Barge No. 765, Lehigh Valley 600

Steamed:
- Tug Chas. P. Greenough—
  - Barge Helen, N. E. C. & C. Co. 1,785
  - Barge Irene, N. E. C. & C. Co. 1,206

Highland Light, wind, 5 p. m., W., 10 miles; cloudy; smooth sea.

Chatham, wind, 5 p. m., SW., moderate breeze; cloudy:
- Passed west—
  - Tug Conestoga—
    - Barge Barry, Reading R. R. 955
    - Barge Leesport, Reading R. R. 963
    - Barge Marion, Reading R. R. 954
- Passed east—
  - Tug Perth Amboy—
    - Barge 781, Lehigh Valley 931
    - Barge 766, Lehigh Valley 600
    - Barge 788, Lehigh Valley 600
  - Steamer Nelson, Cuba Distilling Co. 4,746

Nobska, wind, 5 p. m. NW., 10 miles; cloudy:
- Passed east—
  - Tug Cumberland—
    - Barge No. 18, Con. Coal Co. 936
    - Barge No. 23, Con. Coal Co. 1,000
- Passed west—
  - Steamer Ruth, A. H. Bull S. S. Co. 3,102
  - Schooner Helvetia (Br.) 499

Vineyard Haven, wind W., moderate breeze; cloudy; smooth sea:
- Arrived and sailed west, schooner Norma P. Coolen (Br.) 200
- Arrived, schooner Lavinia M. Snow (Br.) 354
- Passed east—
  - Tug Lenape—
    - Barge Pocopson, Reading R. R. 721
    - Barge Robesonia, Reading R. R. 955
    - Barge Moselem, Reading R. R. 963
  - Tug Gettysburg—
    - Barge Exeter, Reading R. R. 1,780
    - Barge Merriam, Reading R. R. 850
    - Barge Oak Hill, Reading R. R. 910
  - Tug Mars—
    - Barge Chas. F. Pritchard, F. W. Munn 861
    - Barge Horace A. Allyn, F. W. Munn 859
    - Barge Westmoreland, F. W. Munn 256

In canal:		Around Cape:	
Steamers	4	Steamers	11
Tugs	4	Tugs	8
Barges	3	Barges	22
Schooners	7	Schooners	3
Total	18	Total	44
Tonnage, estimated	16,592	Tonnage, estimated	54,249

Tug Gwalia, eastbound with barges Biwabik, Annie, and R. W. McDonald, arrived in Vineyard Haven December 6. Passed Shovelful December 11.

Tug Murrell, Reading R. R., with 3 barges, arrived Vineyard December 6. Left December 11.

Tug Calvert, C. W. Chadwick & Co., arrived in Vineyard December 4. Left December 11.

DECEMBER 12, 1916.

Passed east:
- Tug Pallas, Dredge Bobfeld 400
- Tug Nottingham, towing 3 barges, L. & W. Coal Co 2,400
- Barge Northern No. 2, Nor. Trans. Co 485
- Barge Maryland 361
- Barge Hamburg 430
- Barge Catherine Howard 583
- Steamer Massachusetts 4,779

Passed west:
- Steamer Bunker Hill 4,779
- Scow No. 22 300

BOSTON.

Arrived:
- Steamer Ontario, from Norfolk, Mer. & Min. T. Co 3,099
- Steamer Hampden, from Baltimore, Coastwise S. S. Co 4,725
- Tug W. B. Keene—
  - Barge Belfast, J. R. Gilman 944
  - Barge Altamaha, J. R. Gilman 944

Steamed:
- Steamer Grecian, for Norfolk, Mer. & Min. T. Co 2,827
- Steamer Dorchester, for Philadelphia, Mer. & Min. T. Co 2,537
- Steamer Malden, for Baltimore, N. E. C. & C. Co 5,107
- Steamer Melrose, for New York, N. E. C. & C. Co 5,107
- Tug Sea King, Barge Nanticoke, P. Dougherty 771

Highland Light, wind 5 p. m, N., 5 miles; thick fog; smooth sea.

Vineyard Haven, wind 5 p. m. S., moderate; choppy sea; thick and rainy:
- Arrived west—
  - Schooner Grand Turk 200
  - Schooner Millie R. Bohannan 686
- Passed east, steamer Arlington, N. E. C. & C. Co 2,431

In canal:		Around Cape:	
Steamers	2	Steamers	7
Tugs	2	Tugs	2
Barges	7	Barges	3
Dredges	1	Schooners	2
Scows	1		
Total	13	Total	14
Tonnage, estimated	14,517	Tonnage, estimated	29,378

A large number of tugs and barges arrived in Boston yesterday, which were reported previously; some of them arriving in the Vineyard as far back as December 4.

DECEMBER 13, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Steamer H. F. Dimock, Eastern S. S. Co 2,625
- Steamer Bay Port, Crowell & Thurlow 1,399

Passed west:
- Steamer Bay State, Crowell & Thurlow 1,245
- Tug Atkins Hughes 115

BOSTON.

Arrived:
- Steamer Kershaw, from Norfolk, Mer. & Min. T. Co 2,599
- Steamer Cretan, from Philadelphia, Mer. & Min. T. Co 2,350
- Steamer Everett, from Newport News, N. E. C. & C. Co 5,107
- Steamer Middlesex, from Norfolk, Coastwise T. Co 4,727

Steamed:
- Steamer Nacoochee, for Savannah, Ocean S. S. Co..... 2,680
- Steamer Ontario, for Newport News, Mer. & Min. T. Co..... 3,099
- Steamer Nelson, for New York, Cuba Distilling Co..... 4,746
- Steamer Corsica, for Norfolk..... 2,364
- Tug Lenape—
  - Barge Tohickon, Reading R. R..... 739
  - Barge Cacoosing, Reading R. R..... 721
  - Barge Pennypack, Reading R. R..... 739
- Tug Cheektowaga—
  - Barge No. 703, Lehigh Valley R. R..... 934
  - Barge No. 788, Lehigh Valley R. R..... 600
  - Barge No. 786, Lehigh Valley R. R..... 700
- Tug Bristol, towing Russian bark Mariechen.....
- Tug Gwalia, barge Potomac, P. Dougherty..... 823
- Tug Lykens—
  - Barge Conewago, Reading R. R..... 956
  - Barge Indian Ridge, Reading R. R..... 910
  - Barge Skippack, Reading R. R..... 739
- Steamer Hampden, for Baltimore, Coastwise S. S. Co..... 4,725
- Steamer Mae, Jas. W. Elwell & Co..... 2,103

Highland Light, wind 4.30 p. m. W., 15 miles; clear; smooth sea:
- Passed east, steamer North Land, Eastern S. S. Co..... 3,282

Chatham:
- Passed west, steamer Old Colony, Eastern S. S. Co..... 4,779

Nobska:
- Passed west, steamer Montara..... 2,562

Vineyard Haven, wind, W., fresh; choppy sea; clear:
- Arrived west, schooner Elsie Porter (Br.)..... 200

In canal:		Around Cape:	
Steamers	4	Steamers	13
Tug	1	Tugs	5
		Barges	10
Total	5	Schooners and barks	2
Tonnage, estimated	10,163	Total	30
		Tonnage, estimated	53,184

DECEMBER 14, 1916.

Arrived Wings Neck:
- Steamer Mohawk, Clyde S. S. Co..... 4,623
- Schooner Emma McAdam..... 166
- Schooner Harry W. Haynes..... 295
- Schooner L. A. Plummer..... 394
- Schooner F. C. Pendleton..... 408
- Schooner Abbie S. Walker..... 190
- Schooner Daniel McLoud..... 295
- Tug Standard, towing 2 barges, Standard T. Co..... 1,600
- Tug Narragansett, towing 1 barge..... 800

Arrived Sandwich:
- Tug Sadie Ross, Barge Sharon, Cabot..... 485
- Schooner Northern Light..... 139
- Schooner Telumah..... 230

Canal blocked to all traffic except light tow boats.

BOSTON.

Arrived:
- Steamer Coastwise from Newport News, Coastwise S. S. Co..... 4,015
- Steamer El Monte from New Orleans, So. Pac. Co..... 3,531
- Steamer Tuscan from Norfolk, Mer. & Min. T. Co..... 2,415
- Steamer Bunker Hill from New York, Eastern S. S. Co..... 4,779
- Tug Nottingham—
  - Barge Wilkes-Barre, L. & W. C. Co..... 1,678
  - Barge No. 10..... 862
  - Barge No. 14..... 953

Steamed:
Tug Cumberland—
Barge No. 7 898
Barge No. 20 940
Barge No. 24 1,566
Steamer Clan Sinclair (Br.) for New York
Steamer Kershaw for Norfolk, Mer. & Min. T. Co 2,599
Steamer Cretan for Philadelphia, Mer. & Min. T. Co 2,350
Steamer Everett for Lamberts Point, N. E. C. & C. Co 5,107
Steamer Walter D. Noyes for Newport News
Highland Light, wind 4.30 p. m. WNW., 10 miles, clear, smooth sea:
Passed west—
Tug Neponsit, barge 86 800
Tug W. B. Keene, towing 3 barges 2,400
Chatham, wind 4.30 p. m. W., light breeze, partly cloudy:
Passed west—
Tug Gettysburg—
Barge Buck Ridge, Reading R. R 915
Barge Draper, Reading R. R 855
Barge Richardson, Reading R. R 693
Steamer Black Rock 1,997
Passed east—
Tug W. S. Taylor—
Barge Coaldale, C. W. Chadwick & Co 831
Barge Lansford, C. W. Chadwick & Co 830
Steamer Harry H. Brown 2,673
Nobska, wind 5 p. m., WNW., 5 miles, clear:
Passed east—
Tug Ontario—
Barge Cadosia, N. Y. O., & W. R. R 756
Barge Ellenville 858
Barge Metacomet 800
Tug Monocacy—
Barge Tabor, Reading R. R 963
Barge Franklin, Reading R. R 910
Barge Spring, Reading R. R 1,780
Tug Standard—
Barge No. 57, Standard T. Co 1,381
Barge No. 124, Standard T. Co 952
Tug Paoli—
Barge Oxford, Sus. Coal Co 836
Barge Nanticoke, Sus. Coal Co 771
Barge Stratford, Sus. Coal Co 678
Passed west, tug Valley Forge—
Barge Mingo, Reading R. R 954
Barge Bear Ridge, Reading R. R 910
Barge Pickerny, Reading R. R 739
Vineyard Haven, wind W., moderate, smooth sea, clear:
Sailed west—
Schooner Elsie Horton (Br.) 200
Schooner Lavina M. Snow 354
Schooner Helvetia 499
Schooner Morma P. Coolen (Br.) 200
Sailed east, tug Carlisle, towing 3 barges, Reading R. R 2,400
Tug Pallas left Boston with wrecking lighter Salvor to work on Bay Port.

In canal:		Around cape:	
Steamers	1	Steamers	11
Tugs	3	Tugs	11
Barges	4	Barges	31
Schooners	8	Schooners	4
Total	16	Total	57
Tonnage, estimated	9,625	Tonnage, estimated	60,628

DECEMBER 15, 1916.

BOSTON.

Arrived:
- Steamer City of Atlanta from Savannah, Ocean S. S. Co..... 5,433
- Steamer Massachusetts from New York, Eastern S. S. Co..... 4,779
- Steamer Jas. S. Whitney from New York, Eastern S. S. Co..... 2,707
- Steamer Bristol from New York..... 284
- Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
- Steamer City of Savannah from New York, Ocean S. S. Co..... 5,654

Steamed:
- Tug Perth Amboy—
  - Barge 702, Lehigh Valley..... 934
  - Barge 705, Lehigh Valley..... 934
  - Barge 765, Lehigh Valley..... 600
- Tug James Wooley, barge Canisteo, C. W. Chadwick..... 671
- Steamer Tuscan, barge Baltimore, Mer. & Min. T. Co..... 2,415

Highland Light, 4.30 p. m., wind NE., 15 miles, snow, smooth sea.

Chatham, 4.30 p. m., wind NE., fresh breeze, snowy:
- Passed east, tug John Scully, Scully Trans. Co..... 413

Nobska, wind NE., 8 miles, cloudy:
- Passed west, steamer Kershaw, Mer. & Min. T. Co..... 2,599
- Passed east, steamer Katahdin, Clyde S. S. Co..... 2,696

Vineyard Haven, wind NE., choppy sea, thick, snowstorm:
- Arrived west, schooner Millie J. Dixon (Br.)..... 200
- Arrived east, tug Coastwise—
  - Barge Chenango, C. W. Chadwick..... 671
  - Barge New Jersey..... 1,347
- Arrived west, tug Lehigh—
  - Barge 707, Lehigh Valley..... 934
  - Barge 742, Lehigh Valley..... 900
  - Barge 781, Lehigh Valley..... 931
- Passed, tug Murrell—
  - Barge Annie, N. E. C. & C. Co..... 1,098
  - Barge Portsmouth, N. E. C. & C. Co..... 1,200

Around cape:
- Steamers..... 9
- Schooners..... 1
- Tugs..... 6
- Barges..... 12

Total..... 28

Tonnage, estimated..... 39,310

The Boston and New York service of the Eastern S. S. Co. has been discontinued indefinitely on account of the blocking of the Cape Cod Canal by the sinking of the Bay Port.

DECEMBER 17, 1916.

BOSTON.

Arrived:
- Steamer City of Everett, Barge S. T. Co. No. 89, Stand T. Co..... 2,595 / 2,451
- Tug Neponsit from Newport, Boston T. B. Co..... 86
- Steamer Grecian from Norfolk, Mer. & Min. T. Co..... 2,827
- Steamer City of Memphis from Savannah, Ocean S. S. Co..... 5,252
- Steamer J. H. Devereux from Sewalls Point, Metro. Coal Co..... 1,618
- Steamer Harvey H. Brown from Norfolk..... 2,673
- Steamer Coastwise from Lamberts Point, Coastwise T. Co..... 4,015

Steamed:
- Steamer Kandahar (Br.) for New York.....
- Steamer El Monte for New York, So. Pacific Co..... 3,531
- Tug Luckenbach No. 2—
  - Barge Solitaire, Luck. S. S. Co..... 1,515
  - Barge Gen. Knox, Luck. S. S. Co..... 1,587

Steamed—Continued.	
Tug John Scully, barge Gov. Robie, Scully T. C.	1,712
Tug Mars—	
Barge Chas. F. Pritchard, F. W. Munn	861
Barge Elk Garden, F. W. Munn	847
Barge Harrisburg, F. W. Munn	1,000
Tug Carlisle—	
Barge Paxtang, Reading R. R.	954
Barge Maple Hill, Reading R. R.	911
Barge Beechwood, Reading R. R.	841
Tug Nottingham—	
Barge L. & W. No. 2, L. & W. C. Co.	958
Barge L. & W. No. 5, L. & W. C. Co.	685
Barge L. & W. No. 9, L. & W. C. Co.	685
Tug Mercury—	
Barge Allentown, L. C. & N. Co.	842
Barges, 2 others	1,600
Vineyard Haven:	
Arrived east—	
Tug Resolute towing 2 barges, P. Dougherty	1,600
Passed east—	
Steamer Newton, N. E. C. & C. Co.	5,194
Steamer Brandon, N. E. C. & C. Co.	
Around cape:	
Steamers	10
Tugs	8
Barges	18
Total	36
Tonnage, estimated	46,840

DECEMBER 18, 1916.

BOSTON.

Arrived:	
Steamer Dorchester from Baltimore, Mer. & Min. T. Co.	2,537
Steamer City of Augusta from Savannah, Ocean S. S. Co.	2,869
Steamer Nantucket from Baltimore, Mer. & Min. T. Co.	2,599
Steamed:	
Steamer Minnesotan for New York, Am-Haw. S. S. Co.	6,655
Steamer City of Savannah for Savannah, Ocean S. S. Co.	5,654
Steamer Artemas (Nor.) for Baltimore	5,076
Steamer Grecian for Baltimore, Mer. & Min. T. Co.	2,827
Steamer Bristol for Norfolk	284
Tug Ontario—	
Barge Forest Belle, N. Y. O. & W. R. R.	1,333
Barge Sidney, N. Y. O. & W. R. R.	745
Barge Ellenville, N. Y. O. & W. R. R.	858
Tug Neponsit, Barge 125	700
Highland Light, wind 4.30 p. m. NW., 25 miles, clear, choppy sea:	
Passed west, tug Wyoming—	
Barge 740, Lehigh Valley R. R.	800
Barge 741	800
Barge 706	934
Chatham, wind 4.30 p. m. W., light breeze, cloudy:	
Passed east, tug Germantown towing 3 barges, Reading R. R.	2,400
Nobska, wind NW., 10 miles cloudy:	
Passed west, tug International towing 3 barges, Reading R. R.	2,400
Passed east—	
Steamer Selwyn Eddy	2,846
Steamer Bay State, Crowell & Thurlow	1,245

Vineyard Haven, wind NW., moderate breeze, cloudy, smooth sea:
Arrived east—

Schooner Daniel McLoud	295
Schooner F. C. Pendleton	408
Schooner Nellie Eaton	118
Schooner Chas. H. Klinck	522
Schooner Abbie S. Walker	190
Schooner L. A. Plummer	394
Schooner Harry W. Haynes	295
Schooner Ravolta (Br.)	147
Schooner Lucille (Br.)	200
Schooner Leora M. Thurlow	213
Tug Atkins, Barge Caddo, Texas Oil Co	432
Tug Boswell towing 2 barges, N. E. C. & C. Co	1,600
Tug Georges Creek towing 2 barges, Con. Coal Co	1,600
Tug Savage towing 2 barges, Con. Coal Co	1,600
Steamer Malden, N. E. C. & C. Co	5,107

Around cape:

Steamers	11
Tugs	9
Barges	20
Schooners	10
Total	50
Tonnage estimated	56,683

DECEMBER 19, 1916.

BOSTON.

Arrived:

Steamer Kershaw from Norfolk, Mer. & Min. T. Co	2,599
Steamer Malden from Baltimore, N. E. C. & C. Co	5,107
Steamer Bay State from Sewalls Point, White Oak T. Co	1,245
Steamer Meteor from Sewalls Point, Pac. C. Co	2,301
Tug John G. Chandler—	
Barge Ruth	435
Barge Ruhama Shaw	473

Steamed:

Steamer Nantucket for Norfolk, Mer. & Min. T. Co	2,599
Steamer Dorchester for Philadelphia, Mer. & Min. T. Co	2,537
Steamer Newton for Newport News, N. E. C. & C. Co	5,194
Steamer City of Augusta for Savannah, Ocean S. S. Co	2,869
Steamer H. M. Whitney for New York, Eastern S. S. Corp	2,706
Tug John F. Lewis, towing 2 barges	

Highland Light, wind, 4.30 p. m., NW., 18 miles, cloudy, smooth sea:
Passed west, tug Monocacy—

Barge Kimberton, P. & R. R. R	955
Barge Langhorne, P. & R. R. R	955
Barge Oley, P. & R. R. R	1,780

Chatham, wind NW., fresh, cloudy:
Passed east—

Steamer Selwyn Eddy	2,846
Tug Cuba, barge Gibson, Staples T. Co	839

Passed west—

Steamer Brandon, N. E. C. & C. Co	2,431
Steamer Grecian, Mer. & Min. T. Co	2,827

Nobska, wind, 5 p. m., NW., 12 miles, cloudy:
Passed west, tug Ontario—

Barge Forest Belle, N. Y., O. & W. R. R	1,333
Barge Sidney, N. Y., O. & W. R. R	745
Barge Ellenville, N. Y., O. & W. R. R	858

Vineyard Haven, wind NW., moderate, smooth sea, cloudy:	
Arrived east—	
Tug May—Barge Easton, Lehigh C. & N. Co	830
Barge Plymouth	373
Tug Perth Amboy	
Tug Wyoming—	
Barge 706, Lehigh Valley	800
Barge 741, Lehigh Valley	800
Barge 740, Lehigh Valley	934
Schooner Andrew Nebinger, Eastern Mfg. Co	293
Schooner Roger Drury, Maine Trans. Co	360
Schooner Emma S. Briggs, J. M. Haynes	294
Passed west, schooner Annie B. Mitchell	
Around cape:	
Steamers	12
Schooners	4
Barges	16
Tugs	6
Total	38
Tonnage, estimated	48,318

DECEMBER 20, 1916.

BOSTON.

Arrived:	
Steamer Cretan from Philadelphia, Mer. & Min. T. Co	2,350
Steamer Everett from Lamberts Point, N. E. C. & C. Co	5,107
Steamer Corsica from Norfolk	2,364
Tug Luckenbach No. 1 from Norfolk	
Tug Conestoga—	
Barge Preston, P. & R. R. R.	19
Barge Manatawny, P. & R. R. R.	721
Barge Neshaming, P. & R. R. R.	721
Tug Fred E. Richards—	
Barge R. & R. L. Co., R. & R. L. Co	1,120
Barge Chemung	671
Barge No. 4	591
Steamed:	
Steamer Kershaw for Norfolk, Mer. & Min. T. Co	2,599
Steamer Katahdin for Charleston, Clyde S. S. Co	2,696
Steamer Malden for Baltimore, N. E. C. & C. Co	5,107
Steamer Grove (Nor.) for New York	
Steamer H. F. Dimock for New York, Eastern S. S. Co	2,625
Steamer J. H. Devereux for Newport News, Metro. Coal Co	1,618
Motor Barge Delivery No. 1 for New York	
Tug Paoli—	
Barge Devon, Sus. Coal Co	724
Barge Strafford	678
Barge Nanticoke	771
Tug John G. Chandler—	
Barge Ruth	435
Barge Ruhama Shaw	473
Barge Albany	659
Tug Eastern—	
Barge Eugenie Hooper	730
Barge W. K. Moore	
Barge N. T. No. 4	
Tug Luckenbach No. 1—	
Barge Carrie Clark, Luck. S. S. Co	1,298
Barge Josephus, Luck. S. S. Co	1,406
Tug Cuba, barge Mt. Hope, Staples Trans. Co	1,801
Steamer Bay State for Newport News, White Oak T. Co	1,245
Highland Light, wind 4.30 p. m., W., 10 miles, clear, smooth sea:	
Passed east, motor barge Danl. M. Munroe (Br.)	800

Chatham, wind NW., fresh breeze, clear:	
Passed west, steamer Sarnolite	
Passed east, tug Watuppa—	
Barge Gibson, Staples T. Co	839
Barge Foster, Staples T. Co	839
Nobska, wind 5 p. m., WNW., fair:	
Passed east—	
Tug North America, barge Scully	
Tug Piedmont—	
Barge No. 14, L. & W. C. Co	953
Barge No. 25, Con. C. Co	1,566
Vineyard Haven, wind westerly, moderate, clear, smooth sea:	
Around cape:	
Steamers	11
Barges	22
Tugs	11
Motor barges	2
Total	46
Tonnage, estimated	43,526

DECEMBER 21, 1916.

BOSTON.

Wind S., 10 miles, thick and raining, smooth sea.	
Arrived:	
Steamer Walter D. Noyes from Norfolk	
Steamer Middlesex from Norfolk, Coastwise T. Co	4,727
Steamer Mae from Newport News, Jas. W. Elwell & Co	2,103
Tug Calvert—	
Barge R. & R. L. Co. No. 5, R. & R. L. Co	1,120
Barge Shickshinny, D., L. & W. R. R	836
Tug John F. Lewis—	
Barge I. D. Fletcher, Coast Transit Co	1,034
Scow No. 5	173
Tug Lykens, barge Marion, P. & R. R. R	954
Tug Savage—	
Barge No. 15, Con. C. Co	912
Barge No. 17, Con. C. Co	935
Steamed:	
Steamer Ontario for Norfolk, Mer. & Min. T. Co	3,099
Steamer Cretan for Philadelphia, Mer. & Min. T. Co	2,350
Steamer James S. Whitney for New York, Eastern S. S. Co	2,707
Steamer Corsica for Norfolk	1,462
Tug Perth Amboy—	
Barge No. 785, Lehigh Valley R. R	700
Barge No. 791, Lehigh Valley R. R	600
Barge No. 795, Lehigh Valley R. R	550
Tug Neponsit, barge S. T. Co. No. 124, S. T. Co	952
Vineyard Haven, wind westerly; moderate; smooth sea:	
Arrived west—	
Tug Western—	
Barge Pilgrim, N. Y., O. & W. R. R	1,215
Barge Liberty, N. Y., O. & W. R. R	856
Barge Smyrna, N. Y., O. & W. R. R	741
Tug Waltham—	
Barge Mt. Hope, Staples T. Co	1,801
Barge Tipton, Staples T. Co	830
Arrived east, schooner Wm. M. Critchett, John Davies	544
Sailed west, schooner Emma S. Briggs, J. M. Haynes	294

Around Cape:
- Steamers 7
- Schooners 2
- Tugs 8
- Barges 16

Total 33

Tonnage, estimated 31,495

DECEMBER 22, 1916.

BOSTON.

Arrived:
- Steamer Hampden from Baltimore, Coastwise S. S. Co 4,725
- Steamer Indian from Philadelphia, Mer. & Min. T. Co 2,110
- Steamer Lexington from Baltimore, Mer. & Min. T. Co 2,092
- Steamer Coastwise from Sewalls Point, Coastwise T. Co 4,105
- Tug Essex—
  - Barge Nay Aug 843
  - Barge R. & R. L. Co. No. 1, R. & R. L. Co 1,120
- Steamer Tuscan from Baltimore, Mer. & Mon. T. Co 2,415

Steamed:
- Steamer Everett for Sewalls Point, N. E. G. & C. Co 5,107
- Steamer Meteor for Newport News, Pac. C. Co 2,301
- Tug Conestoga—
  - Barge Monitor, P. & R. R. R 954
  - Barge Ontelaunce, P. & R. R. R 739
  - Barge Pocopson, P. & R. R. R 721

Highland Light, wind 4 p. m., SW., 35 miles; cloudy and foggy; smooth sea.
Nobska, wind 4 p. m. SWS., 40 miles, fog and rain.
Vineyard Haven, wind a. m. SE., p. m. westerly, heavy gale:
- Arrived west—
  - Tug Richmond, towing 3 barges 1,800
  - Tug Honeybrook, towing 3 barges 2,100

Around cape:
- Steamers 7
- Tugs 4
- Barges 11

Total 22

Tonnage, estimated 31,132

DECEMBER 25, 1916.

BOSTON.

Arrived:
- Tug Valley Forge—
  - Barge Barry, P. & R. R. R 954
  - Barge Cacoosing, P. & R. R. R 721
  - Barge Conewago, P. & R. R. R 956
- Tug Lenape—
  - Barge Brookside, P. & R. R. R 841
  - Barge Thomaston, P. & R. R. R 693
  - Barge Ephrata, P. & R. R. R 954
- Tug Paoli towing barges .....

Steamed:
- Steamer Nantucket for Newport News, Mer. & Min. T. Co 2,599
- Steamer Texan for New York, Amer.-Hawaiian S. S 8,615

Vineyard Haven, wind NW., heavy, cloudy, rough sea.
Arrived west, schooner Maud S..... 79
Arrived east—
Tug Calvert—
Barge R. & R. L. Co. No. 5, R. & R. L. Co..... 1,120
Barge Wm. J. Lermond, R. & L. R. Co..... 887
Tug May—
Barge Coaldale, Lehigh C. & N..... 831
Barge Panther Creek, Lehigh C. & N..... 739
Tug Atkins Hughes, barge Caddo, Texas Oil Co..... 432
Steamed east, tug Concord—
Barge Havana, Staples T. Co..... 1,617
Barge Tipton..... 830

Around cape:
Steamers..... 2
Schooners..... 1
Tugs..... 7
Barges..... 13

Total..... 23

Tonnage, estimated..... 21,868

DECEMBER 27, 1916.

BOSTON.

Arrived:
Steamer City of Savannah from Savannah, Ocean S. S. Co..... 5,654
Steamer J. H. Devereux from Newport News, Metro. Coal Co..... 1,618
Steamer Ontario from Norfolk, Mer. & Min. T. Co..... 3,099
Tug Fred E. Richards, barge Waccamaw..... 349
Tug Swatara—
Barge Indian Ridge, P. & R. R. R..... 910
Barge Beechwood, P. & R. R. R..... 841
Barge Richardson, P. & R. R. R..... 693
Barge John Boyle, from New York, N. Y. & Boston T. Co..... 436
Steamed:
Steamer Walter D. Noyes for Newport News.....
Steamer Prince Arthur (Br.) for New York..... 2,041
Steamer Lexington for Norfolk, Mer. & Min. T. Co..... 2,092
Steamer City of Atlanta for Savannah, Ocean S. S. Co..... 5,433
Tug Valley Forge—
Barge Oak Hill, P. & R. R. R..... 910
Barge Preston, P. & R. R. R..... 855
Barge Neshaminy, P. & R. R. R..... 721
Tug Luckenbach No. 4, barge San Joaquin, Luckenbach..... 1,551
Sailed west, schooner Annie P. Chase.....
Highland Light, wind 5 p. m. NW., 30 miles; clear; rough sea:
Passed east, steamer Norfolk, P. Dougherty Co..... 589
Nobska, wind NW., 14 miles; clear:
Passed east—
Steamer Roman Prince (Br.).....
Steamer Huron..... 4,810
Steamer Malden, N. E. C. & C. Co..... 5,107
Tug Charles W. Parker, jr.—
Barge Alice, N. E. C. & C. Co..... 640
Barge Beattie, N. E. C. & C. Co..... 1,117
Passed west, schooner Wm. M. Crichett..... 544
Vineyard Haven:
Passed east, steamer Inland.....

Around cape:	
Steamers	12
Schooners	2
Tugs	5
Barges	11
Total	30
Tonnage, estimated	40,010

Schooner Roger Drury, New York for St. John, New Brunswick, sunk off Great Point; schooner Daniel McLoud, New York for Boothbay, stranded on northern end of Rip, Great Point; schooner Ravola (Br.) Perth Amboy for Annapolis, was wrecked on the southern end of the Rip in Gate to-day; crews of all vessels saved. The Ravola and Daniel McLoud, it is thought, will be total wrecks.

These three schooners had signed the agreement to use the canal exclusively.

DECEMBER 27, 1916.

BOSTON.

Arrived:	
Steamer Kershaw from Norfolk, Mer. & Min. T. Co	2,599
Steamer Matoa from Sewalls Point, Mer. & Min. T. Co	2,311
Steamer Minneapolis from Port Reading	235
Tug Bristol from Newport News, L. &. N. C. Co	529
Steamer Harvey H. Brown from Norfolk	2,673
Steamed:	
Steamer Ontario for Newport News, Mer. & Min. T. Co	3,099
Steamer Grekland (Sw.) for Baltimore	
Steamer Mae for Norfolk, Jas. Elwell & Co	2,103
Steamer Hampden for Baltimore, Coastwise S. S	4,725
Tug Savage—	
Barge No. 4, Con. C. Co	927
Barge No. 19, Con. C. Co	932
Tug Honeybrook—	
Barge L. & W. No. 3	852
Barge L. & W. No. 14	953
Barge Wilkes-Barre, L. & W	1,678
Highland Light, wind 4 p. m. SW., 10 miles; thick fog; smooth sea.	
Chatham, wind S., fresh, cloudy:	
Passed east—	
Steamer Brandon, N. E. C. & C. Co	2,431
Tug Monocacy, barge Tohickon, P. & R. R. R	739
Nobska:	
Passed west, steamer Philadelphia	1,306
Vineyard Haven, wind p. m. southerly, moderate; thick and rainy:	
Arrived east—	
Schooner John Bracewell	224
Tug Charles P. Greenough—	
Barge Irene, N. E. C. & C. Co	1,206
Barge Helen	1,285
Tug Boxer, barge Yemassee, F. W. Munn	1,100
Tug Mars, towing 3 barges, F. W. Munn	2,400
Tug Wyoming, towing 3 barges, Lehigh Valley R. R	2,400

Around cape:	
Steamers	10
Schooners	1
Tugs	7
Barges	15
Total	33
Tonnage, estimated	36,708

Nantucket, December 27.—Fisherman brought into port apparently seaworthy schooner Roger Drury from New York for St. John, New Brunswick, which was abandoned yesterday.

DECEMBER 28, 1916.

BOSTON.

Arrived:	
Steamer Tuscan from Norfolk, Mer. & Min. T. Co	2,415
Steamer James S. Whitney from New York, Eastern S. S. Co	2,707
Steamer Cretan from Philadelphia, Mer. & Min. T. Co	2,350
Tug Carlisle—	
Barge Bear Ridge, P. & R. R. R	910
Barge Pickering, P. & R. R. R	739
Barge Skippack, P. & R. R. R	739
Steamed:	
Steamer City of Savannah for Savannah, Ocean S. S. Co	5,654
Steamer Sabine (Br.) for New York	2,992
Steamer Kershaw for Norfolk, Mer. & Min. T. Co	2,599
Steamer Cretan for Philadelphia, Mer. & Min. T. Co	2,350
Steamer Malden for Baltimore, N. E. C. & C. Co	5,107
Steamer H. M. Whitney for New York, Eastern S. S. Co	2,706
Steamer J. H. Devereux for Newport News, Metro. Coal Co	1,618
Steamer Harvey H. Brown for Sewalls Point	2,673
Tug Gettysburg—	
Barge Mahanoy, P. & R. R. R	855
Barge Temple, P. & R. R. R	963
Barge Manheim, P. & R. R. R	955
Tug Swatara—	
Barge Bethayres, P. & R. R. R	955
Barge Paxinos, P. & R. R. R	954
Barge Henry Clay, P. & R. R. R	841
Tug W. H. Yerkes, jr., barge Katherine Howard	583
Highland Light, wind, 4.30 p. m., W. 35 miles, cloudy; smooth sea.	
Nobska, wind, WSW.; rain and fog.	
Vineyard Haven, wind, a. m., calm; thick fog; raining; p. m.; westerly, moderate clearing; smooth sea:	
Arrived west, tug Luckenbach No. 3:	
Barge Washington-Luckenbach	1,724
Barge Wm. Babcock	2,128
Tug John Scully, towing 1 barge, Scully	800
Sailed east, schooner Charles H. Klinck	522
Around cape:	
Steamers	11
Schooners	1
Tugs	6
Barges	13
	31
Tonnage, estimated	46,839

DECEMBER 29, 1916.

BOSTON.

Arrived:	
Steamer City of Augusta from Savannah, Ocean S. S. Co	2,869
Steamer Everett from Sewalls Point, N. E. C. & C. Co	5,107
Steamer H. F. Dimock from New York, Eastern S. S. Co	2,625
Steamer Coastwise from Norfolk, Coastwise S. S. Co	4,015
Steamer Grecian from Baltimore, Mer. & Min. T. Co	2,827
Steamed:	
Steamer Yuma for New York	2,194
Steamer Tuscan for Newport News, Mer. & Min. T. Co	2,415
Steamer Brandon for Newport News, N. E. C. & C. Co	2,431
Steamer Roman Prince (Br.) for New York	
Steamer Minneapolis for Port Reading, U. S. S	235
Tug Bristol, barge Foster, Staples T. Co	841
Tug Carlisle—	
Barge Cacoosing, P. & R. R. R	721
Barge Conewago	956
Barge Manatawny	721

Steamed—Continued.	
Tug Hugh Ross, barge Plymouth, Lehigh Coal & N	373
Tug Fred E. Richards—	
Barge R. & R. L. No. 4	1,120
Barge R. & R. L. No. 6	1,120
Barge Chenango	671
Highland Light, wind, noon, NW., 35 miles; clear; rough sea.	
Chatham, wind, NW., strong breeze; clear.	
Vineyard Haven, wind NW., fresh; choppy sea; clear:	
Arrived west, schooner Vineyard	215
Sailed east, Wanola (Br.)	272
Nobska, wind, NE., 12 miles; clear:	
Passed east, steamer Robert M. Thompson, Girard T. Co	2,458
Around cape:	
Steamers	11
Schooners	1
Barges	8
Tugs	4
	24
Tonnage, estimated	34,186

JANUARY 1, 1917.

BOSTON.

Arrived:	
Tug Perth Amboy—	
Barge No. 703	
Barge Cohocton, D., L. & W	671
Barge Tobyhanna, D., L. & W	836
Tug Plymouth—	
Barge Pittston, Erie R. R	466
Barge Passaic, Erie R. R	875
Barge Marion, Erie R. R	693
Tug John Scully—	
Barge I. F. Chapman, Scully	2,146
Barge Henry Failing, Scully	1,976
Tug Germantown—	
Barge Ontelaunee, P. & R. R. R	739
Barge Langhorne, P. & R. R. R	955
Barge Maple Hill, P. & R. R. R	911
Tug Lykens—	
Barge Draper, P. & R. R. R	855
Barge Kimberton, P. & R. R. R	955
Barge Paxtang, P. & R. R. R	954
Tug Paoli—	
Barge Radnor, Sus. Coal Co	678
Barge Devon, Sus. Coal Co	724
Barge Shamokin, Sus. Coal Co	829
Tug Confidence, barge Helen Woods	505
Steamer City of Memphis from Savannah, Ocean S. S. Co	5,252
Steamer Nantucket from Baltimore, Mer. & Min. T. Co	2,599
Steamer Moldegaard from Norfolk, Ocean Frt. Line	2,852
Steamer Selwyn Eddy from Norfolk	2,846
Steamed:	
Tug Lehigh—	
Barge No. 704, Lehigh Valley	934
Barge No. 766, Lehigh Valley	530
Barge No. 780, Lehigh Valley	926
Tug Perth Amboy	
Tug Concord—	
Barge Fall River, Staples T. Co	1,759
Barge Gibson, Staples T. Co	839
Tug Luckenbach—	
Barge West Point, Luckenbach	1,213
Barge J. B. Walker, Luckenbach	2,136
Tug Standard II, barge S. T. Co. No. 57, Stand. T. Co	1,381

Steamed—Continued.
Tug Germantown—
Barge Beechwood, P. & R. R. R. 841
Barge Ephrata, P. & R. R. R. 954
Barge Barry, P. & R. R. R. 954
Vineyard Haven, wind SW., fresh breeze, cloudy, choppy sea:
Arrived west—
Schooner Helen P 145
Schooner Wapiti (Br.) 100
Arrived east—
Schooner William Bisbee 309
Schooner B. I. Hazard 392
Charles L. Jeffrey 348
Tug Charles P. Greenough—
Barge Hattie, N. E. C. & C. Co 1,286
Barge Flora 865
Barge Clara 828
Tug Cumberland—
Barge No. 25, Cons. C. Co 1,566
Barge Nol 15, Cons. C. Co 912

JANUARY 2, 1917.

BOSTON.

Arrived:
Steamer Middlesex from Norfolk, Coastwise T. Co 4,727
Steamer Hermion (Nor.) from New York .....
Steamer Kershaw from Norfolk, Mer. & Min. T. Co 2,599
Steamer Katahdin from Charleston, Clyde S. S. Co 2,696
Steamer Mantansas from New Orleans 3,094
Steamer Newton from Sewalls Point, N. E. C. & C. Co 5,194
Steamer Bay State from Newport News, White Oak T. Co 1,245
Tug Mercury—
Barge Pocono, D., L. & W 698
Barge Rahn, Lehigh C. & M 932
Steamed:
Steamer Walter D. Noyes for Sewalls Point .....
Steamer Nantucket for Norfolk, Mer. & Min. T. Co 2,599
Steamer Robert M. Thompson for Norfolk, Girard T. Co 2,458
Tug Essex—
Barge Lansford, Lehigh C. & N. Co 830
Barge Shickshinny, D., L. & W 836
Highland Light, wind 5 p. m. NW., 10 miles, clear, smooth sea.
Nobska, wind W., 1 mile, cloudy:
Passed east, steamer Richmond, Stand. T. Co 6,563
Vineyard Haven:
Steamed, tug Neponsit, barge E. R. Haggett 750
Around cape:
Steamers 11
Tugs 3
Barges 5
Total 19
Tonnage, estimated 35,221

Around cape:
Steamers 4
Schooners 5
Tugs 15
Barges 34
Total 58
Tonnage, estimated 48,525

JANUARY 3, 1917.

BOSTON.

Arrived:	
Steamer Norfolk from Jacksonville, Coastwise S. S	3,521
Steamer Bristol from Norfolk, Coastwise S. S	284
Steamer James S. Whitney from New York, Eastern S. S. Co	2,707
Steamer Ontario from Norfolk, Mer. & Min. T. Co	3,099
Steamed:	
Steamer Kershaw for Baltimore, Mer. & Min. T. Co	2,599
Steamer Newton for Sewalls Point, N. E. C. & C. Co	5,194
Steamer City of Memphis for New York, Ocean S. S. Co	5,252
Steamer Selwyn Eddy for New York	2,846
Tug Nottingham—	
Barge L. & W. Co. No. 10, L. & W. C. Co	862
Barge L. & W. Co. No. 7, L. & W. C. Co	685
Barge L. & W. Co. No. 11, L. & W. C. Co	862
Highland Light, wind SE., 10 miles, cloudy, smooth sea.	
Chatham, wind SE., fresh breeze, raining:	
Passed east, steamer Brandon, N. E. C. & C. Co	2,431
Nobska, wind SE., 10 miles, rain:	
Passed west, steamer Huron	4,810
Vineyard Haven, wind southerly, moderate; p. m., thick and rainy:	
Arrived west—	
Tug May—	
Barge Allentown, L. C. & N. Co	842
Barge Musconetcong, D., L. & W	843
Tug Perth Amboy—	
Barge 782, Lehigh Valley R. R	924
Barge 790, Lehigh Valley R. R	530
Barge 707, Lehigh Valley R. R	934
Tug Lenape—	
Barge Herndon, P. & R. R. R	1,763
Barge Macungie, P. & R. R. R	956
Sailed east—	
Schooner Colin C. Baker	410
Schooner H. B. Ayer	300
Schooner Manie Saunders	279
Sailed west—	
Schooner Revenue (Br.)	
Schooner Rebecca R. Douglass	475
Around cape:	
Steamers	10
Schooners	5
Tugs	4
Barges	10
Total	28
Tonnage, estimated	43,408

JANUARY 4, 1917.

BOSTON.

Arrived:	
U. S. fuel ship Nereus from Norfolk	217
Steamer Cretan from Philadelphia, Mer. & Min. T. Co	2,350
Steamer Hampden from Baltimore, Coastwise S. S	4,725
Steamer City of Atlanta from Savannah, Ocean S. S	5,433
Steamer Grecian from Norfolk, Mer. & Min. T. Co	2,827
Steamed:	
Steamer Ontario for Norfolk, Mer. & Min. T. Co	3,099
Steamer Cretan for Philadelphia, Mer & Min. T. Co	2,350
Steamer Bay State for Newport News, White Oak T. Co	1,245
Steamer Cluny Castle (Br.) for New York	
Steamer Brandon for Sewalls Point, N. E. C. & C. Co	2,431
Steamer Middlesex for Norfolk, Coastwise T. Co	4,727

Steamed—Continued.
Steamer Socony Barge S. T. Co. No. 90, Stand. T. Co..... 2,451
Steamer Moldegaard for Lamberts Point, Ocean Frt. Line..... 2,852
Tug Neponset—
Barge Mary A. Kenneally..... 480
Barge John C. Fields..... 444
Tug Charles W. Parker, jr.—
Barge Helen, N. E. C. & C. Co..... 1,285
Barge Irene..... 1,206
Steamer Kershaw for Baltimore, Mer. & Min. T. Co..... 2,599
Highland Light, wind, 4.30 p. m., NNE., 10 miles, foggy, moderate sea.
Around cape:
Steamers..... 13
Fuel ships..... 1
Tugs..... 2
Barges..... 5

Total..... 21

Tonnage, estimated..... 40,721

JANUARY 5, 1917.

BOSTON.

Arrived:
Steamer Tuscan from Norfolk, Mer. & Min. T. Co..... 2,415
Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
Steamer Malden from Baltimore, N. E. C. & C. Co..... 5,107
Steamer Everett from Newport News, N. E. C. & C. Co..... 5,107
Steamer El Paso from New Orleans, Southern Pac. Co..... 3,531
Steamer Coastwise from Sewalls Point, Coastwise T. Co..... 4,105
Steamer H. F. Dimock from New York, Eastern S. S..... 2,625
Tug Luckenbach No. 1, barge Gen. Knox, Luckenbach..... 1,587
Steamed:
Steamer Grecian for Baltimore, Mer. & Min. T. Co..... 2,827
Steamer James S. Whitney for New York, Eastern S. S. Co..... 2,707
Steamer Matanzas for New York..... 3,094
Tug Luckenback No. 1.....
Tug Plymouth—
Barge R. & R. L. Co. No. 7, R. & R. L. Co..... 1,120
Barge Scully, Scully..... 1,542
Barge Easton, Lehigh C. & N..... 830
Highland Light, wind, 5 p. m., SSE., 25 miles; thick and raining; moderate sea.
Nobska, wind ESE, 5 miles; light fog.
Vineyard Haven, wind SE; fresh; rough sea; p. m., thick and raining:
Arrived west—
Tug Patience—
Barge Charles F. Prichard, F. W. Munn..... 861
Barge Elk Garden, F. W. Munn..... 847
Barge Harrisburg, F. W. Munn..... 1,283
Tug Gwalia—
Barge Potomac, P. Dougherty..... 823
Barge Providence, Shawmut S. S..... 1,250
Barge Emilie, N. E. C. & C. Co..... 1,069
Tug Georges Creek, towing 3 barges, Cons. Coal Co..... 2,400
Tug Pied ont, towing 3 barges, Cons. Coal Co..... 2,400
Tug Honeyb ook, towing 3 barges, Lehigh & W. C. Co..... 2,400

Around Cape:
Steamers..... 10
Tugs..... 8
Barges..... 19

Total..... 37

Tonnage, estimated..... 52,040

JANUARY 7, 1917.

BOSTON.

Arrived:	
Tug W. H. Yerkes, barge Kenneth W. McNeil	578
Tug Murrell—	
Barge Portsmouth, N. E. C. & C. Co	1,159
Barge Annie, N. E. C. & C. Co	1,098
Tug Standard—	
Barge S. T. No. 6, Stand. T. Co	795
Barge S. T. No. 124, Stand. T. Co	952
Tug North America—	
Barge Rondout, Erie R. R	831
Barge Troy, Erie R. R	486
Barge Riverside, Erie R. R	863
Tug Cuba, barge Mount Hope, Staples T. Co	1,801
Tug Eureka—	
Barge Cardenas, Staples T. Co	1,576
Barge Chatham, Staples T. Co	1,812
Tug John G. Chandler—	
Barge Ruth	435
Barge Ruhama Shaw	473
Steamer Missourian from New York, Amer.-Hawaiian S. S	7,914
Steamer Comet from New York, Stand. T. Co	2,486
Steamer Nantucket from Norfolk, Mer. & Min. T. Co	2,599
Steamer Harvey H. Brown from Norfolk	2,673
Steamer Melrose from Newport News, N. E. C. & C. Co	5,107
Steamed:	
Steamer Newby Hall (Br.) for New York, R. Alexander & Co	4,388
Steamer Indian for Philadelphia, Mer. & Min. T. Co	2,110
Steamer Hampden for Baltimore, Coastwise S. S	4,725
Steamer Norfolk for Charleston, Coastwise S. S	3,521
Steamer Tuscan for Norfolk, Mer. & Min. T. Co	2,415
Steamer Matoa for Sewalls Point, Mer. & Min. T. Co	2,311
Steamer City of Atlanta for Savannah, Ocean S. S	5,433
Tug Lenape—	
Barge Glendower, P. & R. R	855
Barge Thomaston, P. & R. R	693
Barge Paxtang, P. & R. R	954
Tug Piedmont—	
Barge No. 10, Cons. C. Co	897
Barge No. 21, Cons. C. Co	905
Tug Patience, barge Hampshire, F. W. Munn	830
Tug Cuba, barge Havana, Staples T. Co	1,617
Vineyard Haven, wind SW., strong; clear; choppy sea:	
Arrived west—	
Schooner Estelle Krieger	1,172
Schooner William Booth	545
Schooner Jesse Hart, 2d	255
Schooner Centennial	115
Schooner Norma P. Coolen (Br.)	
Tug Boswell—	
Barge John H. Winstead, Eastern T. Co	841
Barge Lynn, Shawmut S. S	1,159
Steamed east, tug May, barge Musconetcong, C. W. Chadwick	843
Around Cape:	
Steamers	12
Tugs	11
Barges	23
Schooners	5
Total	51
Tonnage, estimated	70,222

JANUARY 8, 1917.

BOSTON.

Arrived:	
Steamer Lexington from Baltimore, Mer. & Min. T. Co	2,092
Steamer Meteor from Sewalls Point, Pac. Coast Co	2,301
Steamer Walter D. Noyes from Sewalls Point	
Steamer J. H. Devereux from Sewalls Point, Metro. Coal Co	1,618
Steamer City of Augusta from Savannah, Ocean S. S. Co	2,869
Tug Gettysburg—	
Barge Moselem, P. & R. R. R	963
Barge Neshaminy, P. & R. R. R	721
Barge Wisconisco, P. & R. R. R	956
Steamed:	
Steamer Missourian for New York, Amer.-Hawaiian S. S	7,914
Steamer Nantucket for Baltimore, Mer. & Min. T. Co	2,599
Steamer Everett for Newport News, N. E. C. & C. Co	5,130
Steamer Arlington for Sewalls Point, N. E. C. & C. Co	2,431
Tug Luckenbach No. 1, barge W. F. Babcock, Luckenbach	2,128
Tug May, barge Cohocton, C. W. Chadwick	671
Highland Light, wind, 4.30 p. m., SW., 24 miles; clear; smooth sea:	
Passed east, steamer Newton, N. E. C. & C. Co	5,194
Passed west, schooner Mary A. Hall	
Chatham, wind SW., fresh breeze; clear:	
Passed east, tug Western—	
Barge Ellenville, N. Y., O. & W. R. R	858
Barge Matacomet, N. Y., O. & W. R. R	852
Barge Sidney, N. Y., O. & W. R. R	745
Vineyard Haven, wind westerly, fresh breeze; clear; choppy sea:	
Arrived west, schooner George E. Klinck	560
Arrived east, schooner Minnie M. Mosher (Br.)	
Arrived west, tug Lehigh, towing 3 barges	2,400
Arrived east, tug Wyoming, towing 3 barges	2,400
Passed east, schooner Francis Goodnow	359
Around Cape:	
Steamers	10
Schooners	4
Tugs	6
Barges	14
Total	34
Tonnage, estimated	45,761

JANUARY 9, 1917.

BOSTON.

Arrived:	
Steamer Ontario from Norfolk, Mer. & Min. T. Co	3,099
Steamer James S. Whitney from New York, Eastern S. S	2,707
Steamer Millinocket from Newport News, A. H. Bull S. S	3,336
Steamer Norfolk from Norfolk, Coastwise S. S	3,521
Tug Prudence, barge Georgia, P. Dougherty Co	1,318
Tug Carlisle—	
Barge Manheim, P. & R. R. R	955
Barge Cleona, P. & R. R. R	956
Tug Swatara—	
Barge Henry Clay, P. & R. R. R	841
Barge Tulpehocken, P. & R. R. R	721
Barge Manatawny, P. & R. R. R	721
Steamed:	
Steamer City of Augusta for Savannah, Ocean S. S	2,869
Steamer Melrose for Sewalls Point, N. E. C. & C. Co	5,107
Steamer Harvey H. Brown for Norfolk	2,673
Steamer H. M. Whitney for New York, Eastern S. S	2,706
Steamer El Paso for New York, Southern Pac	3,531
Steamer J. H. Devereux for Norfolk, Metro. Coal Co	1,618
Steamer Lexington for Norfolk, Mer. & Min. T. Co	2,092

Highland Light, wind 4.30 p. m., SW., 15 miles; cloudy:
Passed east, steamer Inland.....
Passed west, tug North America—
Barge Scully, Scully..... 1,542
Barge I. F. Chapman, Scully..... 2,146
Vineyard Haven, wind SW., fresh; choppy sea; cloudy:
Arrived west, tug May, barge Allentown, L., C. & N. Co..... 842
Passed east, steamer Robert M. Thompson, Girard T. Co..... 2,458

Around cape:
Steamers..... 12
Tugs..... 5
Barges..... 9

Total..... 26

Tonnage, estimated..... 45,759

JANUARY 10, 1917.

BOSTON.

Arrived:
Steamer Corsica from Norfolk..... 2,364
Steamer Kershaw from Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Cretan from Philadelphia, Mer. & Min. T. Co..... 2,350
Tug Standard No. 2—
Barge No. 5, Standard T. Co..... 795
Barge No. 125, Standard T. Co..... 952
Tug Monocacy—
Barge Oley, P. & R. R. R..... 1,780
Barge Paxinos, P. & R. R. R..... 954
Barge Robesonia, P. & R. R. R..... 955
Steamed:
U. S. destroyer Jarvis for Newport.
Steamer Ontario for Baltimore, Mer. & Min. T. Co..... 3,099
Steamer Onandaga for New York, Clyde S. S. Co..... 2,696
Steamer Meteor for Sewalls Point, Pac. Coast Co..... 2,301
Steamer Walter D. Noyes for New York.....
Steamer Nelson for New York, Cuba Distilling Co..... 4,746
Tug Georges Creek—
Barge Passaic, Erie R. R..... 875
Barge No. 17, Cons. Coal Co..... 935
Barge No. 24, Cons. Coal Co..... 1,566
Tug Murrell—
Barge Biwabik, N. E. C. & C. Co..... 1,401
Barge Potomac, P. Dougherty Co..... 823
Tug Swatara—
Barge Tohickon, P. & R. R. R..... 739
Barge Richardson, P. & R. R. R..... 693
Tug Carlisle—
Barge Bear Ridge, P. & R. R. R..... 910
Barge Pickering, P. & R. R. R..... 739
Barge Skippack, P. & R. R. R..... 739
Highland Light, wind 5 p. m. SW., 18 miles; cloudy and foggy; smooth sea:
Passed east, steamer Brandon, N. E. C. & C. Co..... 2,431
Chatham, wind S., fresh; cloudy:
Vineyard Haven:
Arrived west—
Tug Savage, towing 2 barges..... 1,400
Tug Tacony—
Barge Upton, Sus. Coal Co..... 843
Barge Strafford, Sus. Coal Co..... 678
Barge Oxford, Sus. Coal Co..... 836
Passed east:
Schooner Singleton Palmer..... 2,859
Schooner Jane Palmer..... 3,138

Around cape:	
Steamers	9
Schooners	2
Tugs	8
Barges	20
Total	39
Tonnage, estimated	47,196

JANUARY 11, 1917.

BOSTON.

Arrived:	
Steamer H. F. Dimock from New York, Eastern S. S	2,625
Steamer Tuscan from Norfolk, Mer. & Min. T. Co	2,415
Steamer Coastwise from Baltimore, Coastwise T. Co	4,015
Tug Conestoga—	
Barge Mahanoy, P. & R. R. R	855
Barge Merriam, P. & R. R. R	855
Schooner Roger Drury from New York	360
Steamed:	
Steamer Corsica for Sewalls Point	2,364
Steamer Kershaw for Norfolk, Mer. & Min. T. Co	2,599
Steamer Cretan for Philadelphia, Mer. & Min. T. Co	2,350
Steamer Macona for New York	
Steamer Idaho (Br.) for New York	4,889
Steamer Norfolk for Norfolk, Coastwise S. S	3,521
Tug Eureka—	
Barge Mount Hope, Staples T. Co	1,801
Barge Chatham, Staples T. Co	1,812
Barge Cardenas, Staples T. Co	1,576
Tug Conestoga—	
Barge Langhorne, P. & R. R. R	955
Barge Molino, P. & R. R. R	954
Barge Ontelaunee, P. & R. R. R	739
Highland Light, wind 4.30 p. m. N., 27 miles; snowing: sea rough.	
Vineyard Haven, wind N., fresh; choppy sea; thick snow:	
Arrived west, tug Plymouth, towing 3 barges	2,400
Sailed west, schooner Assurance (Br.)	
Around cape:	
Steamers	9
Schooners	2
Tugs	4
Barges	11
Total	26
Tonnage, estimated	37,085

JANUARY 12, 1917.

BOSTON.

Arrived:	
Steamer Indian from Philadelphia, Mer. & Min.T. Co	2,110
Steamer Nacoochee from Savannah, Ocean S. S	2,680
Steamer Grecian from Baltimore, Mer. & Min. T. Co	2,827
Steamer H. M. Whitney from New York, Eastern S. S	2,706
Steamed:	
Tug John G. Chandler—	
Barge Ruth	435
Barge Ruhama Shaw	473
Steamer Millinocket for Sewalls Point, A. H. Bull S. S	3,336
Steamer Patagonier (Br.) for New York	1,827
Steamer H. F. Dimock for New York, Eastern S. S	2,625
Steamer Robert M. Thompson for New York, Girard T. Co	2,458
Steamer Tuscan for Baltimore, Mer. & Min. T. Co	2,415

Steamed—Continued.
Tug Mercury—
Barge Troy, Erie R. R..... 660
Barge Marion, Erie R. R..... 693
Barge Musconetcong, Erie R. R..... 843
Tug Prudence—
Barge Iron Queen, P. Dougherty Co..... 1,384
Barge R. W. McDonald.....
Barge Georgia, P. Dougherty Co..... 1,318
Tug Boswell—
Barge Alice, N. E. C. & C. Co..... 640
Barge Annie, N. E. C. & C. Co..... 1,098
Tug Western—
Barge Metacomet, N. Y. O. & W. R. R..... 852
Barge Liberty, N. Y. O. & W. R. R..... 856
Barge Smyrna, N. Y. O. & W. R. R..... 741
Tug Essex—
Barge Nay Aug, Lehigh C. & N. Co..... 843
Barge Rahn, Lehigh C. & N. Co..... 932
Barge Pittston, Lehigh C. & N. Co..... 466
Sailed west, schooner Elsie M. Hart (Br.).....
Highland Light, wind 4.30 p. m. NW., 15 miles; clear:
Passed west, steamer Black Rock..... 1,997
Passed east, steamer Binghamton..... 1,462
Chatham, wind NW., fresh breeze; clear:
Passed east, steamer North Land, Eastern S. S..... 3,282
Passed west, steamer Herman Winter, Eastern S. S..... 2,625
Vineyard Haven, wind NW., fresh; clear; choppy sea:
Arrived west—
Steamer Matoa, Mer. & Min. T. Co..... 2,311
Schooner Wm. D. Marvel.....
Tug Nottingham, towing 3 barges..... 2,400
Tug Paoli—
Barge Nanticoke, P. Dougherty Co..... 771
Barge Haverford, Sus. Coal Co..... 678
Passed west, steamer Malden, N. E. C. & C. Co..... 5,107
Around cape:
Steamers..... 15
Schooners..... 2
Tugs..... 8
Barges..... 21
Total..... 46
Tonnage, estimated..... 55,851

JANUARY 13, 1917.

SHIPPING ILLUSTRATED.

The Cape Cod Canal is still closed to navigation, the steamer that sunk near the entrance about a month ago not having yet been lifted. Coastwise vessels bound east from New York are making long passages, the weather of late having been such that few captains cared about rounding Cape Cod. The schooner L. A. Plummer was about a month in reaching Portland from Carteret, N. J.

JANUARY 14, 1917.

BOSTON.

Arrived:
Steamer Arlington from Norfolk, N. E. C. & C. Co..... 2,431
Steamer Inveric (Br.) from England via New York, A. Weir & Co..... 4,789
Steamer Herschel (Br.) from Cardiff via Newport News.....
Steamer Dorchester from Philadelphia..... 1,085
Steamer Everett from Newport News, N. E. C. & C. Co..... 5,107
Steamer Hampton from Baltimore, Coastwise S. S..... 4,725
Steamer Melrose from Norfolk, N. E. C. & C. Co..... 5,107
Steamer Middlesex from Norfolk, Coastwise T. Co..... 4,727

Steamed:
Steamer Malden for Baltimore, N. E. C. & C. Co..... 5,107
Steamer Selwyn Eddy for Norfolk..... 2,846
Steamer Indian for Philadelphia, Mer. & Min. T. Co..... 2,110

Vineyard Haven, wind a. m. S., strong; rough sea; thick rain. P. m. west, fresh choppy sea:

Arrived west, tug Valley Forge—
Barge Temple, P. & R. R. R..... 963
Barge Cacoosing, P. & R. R. R..... 721
Barge Exeter, P. & R. R. R..... 1,780
Arrived east, tug Perth Amboy towing 3 barges..... 2,400

Around cape:
Steamers..... 11
Tugs..... 2
Barges..... 6

Total..... 19

Tonnage, estimated..... 43,898

JANUARY 15, 1917.

BOSTON.

Arrived:
Steamer City of Atlanta from Savannah, Ocean S. S..... 5,433
Steamer Nantucket from Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Clan Mac Nab (Br.) from Calcutta via Norfolk..... 4,675
Steamer Lexington from Norfolk, Mer. & Min. T. Co..... 2,092
Steamed:
Tug Standard II, barge No. 123, Stand. T. Co..... 952
Steamer Philadelphia for Charleston..... 1,306
Steamer Dorchester for Baltimore, Mer. & Min. T. Co..... 2,537
Steamer James S. Whitney for New York, Eastern S. S..... 2,707
Steamer Macknaw (Br.) for Philadelphia, Atlantic T. Co..... 3,204
Tug S. T. Brown, barge Berkley, Staples T. Co..... 650
Tug Neponset, barge Willis G. Towne..... 579
Highland Light, wind 4.30 p. m. NNW., 15 miles; smooth sea.
Chatham, wind NW., light breeze; cloudy.
Nobska, wind 5 p. m. NW., 5 miles; cloudy:
Passed west—
Tug Monocacy—
Barge Leesport, P. & R. R. R..... 963
Barge Mingo, P. & R. R. R..... 954
Barge Pennypack, P. & R. R. R..... 739
Steamer Mohawk, Clyde S. S..... 4,623
Vineyard Haven, wind northerly, moderate breeze; cloudy; smooth sea:
Arrived west—
Tug Standard—
Barge S. T. Co., No. 6, Stand. T. Co..... 795
Barge S. T. Co. No. 124, Stand. T. Co..... 952
Tug Charles P. Greenough—
Barge Clara, N. E. C. & C. Co..... 828
Barge Hattie..... 1,286
Barge Eugene Hooper..... 730
Tug Tamaqua—
Barge Conewago, P. & R. R. R..... 956
Barge Barry, P. & R. R. R..... 954
Barge Beechwood, P. & R. R. R..... 841
Tug Cumberland—
Barge No. 14, Cons. C. Co..... 927
1 other barge, Cons. C. Co..... 900
Tug Mars, towing 3 barges..... 2,400
Sailed west, schooner Elsie M. Hart (Br.).....

Around cape:	
Steamers	9
Schooners	1
Tugs	9
Barges	19
Total	38
Tonnage, estimated	45,582

JANUARY 16, 1917.

BOSTON.

Arrived:	
Steamer Walter D. Noyes from Norfolk	
Steamer Kershaw from Norfolk, Mer. & Min. T	2,599
Steamer J. H. Devereux from Newport News, Metro. Coal Co	1,618
Steamed:	
Steamer Melrose for Sewalls Point, N. E. C. & C. Co	5,107
Steamer Nantucket for Norfolk, Mer. & Min. T. Co	2,599
Steamer Lexington for Philadelphia, Mer. & Min. T. Co	2,092
Steamer Middlesex for Norfolk, Coastwise S. S	4,727
Steamer Everett for Lamberts Point, N. E. C. & Co	5,107
Steamer Arlington for Norfolk, N. E. C. & C. C. Co	2,431
Highland Light, wind 4.40 p. m. NW., 12 miles; clear; smooth sea.	
Chatham, wind NW., partly cloudy.	
Passed west, tug Fred E. Richards—	
Barge R. & R. L. Co. No. 6, R. & R. L. Co	1,120
Barge R. & R. L. Co. No. 2	1,120
Barge Tamaqua	830
Nobska, wind 2.25 p. m. NW., 6 miles; clear.	
Passed west, steamer Susquehanna (Br.)	3,711
Vineyard Haven, wind NW., moderate; smooth sea; clear:	
Steamed east—	
Tug Triton, barge Iowa, Seaboard T. Co	1,606
Tug Tacony—	
Barge Oxford, Sus. Coal Co	836
Barge Upton, Sus. Coal Co	843
Barge Strafford, Sus. Coal Co	678
Tug Lehigh—	
Barge No. 791, Lehigh Valley R. R	900
Barge No. 705	934
Barge No. 742	1,210
Tug Wätuppa, barge Fall River, Staples T. Co	1,759
Tug Lykens—	
Barge Oak Hill, P. & R. R. R	910
Barge Franklin, P. & R. R. R	910
Barge Brookside, P. & R. R. R	841
Tug Valley Forge—	
Barge Exeter, P. & R. R. R	1,780
Barge Temple, P. & R. R. R	963
Barge Cacoosing, P. & R. R. R	721
Tug May, barge Allentown, Lehigh C. & N	842
Passed west, tug Gypsum King—	
Barge Hamburg, J. B. King Co	430
Barge Lewis H. St. John, J. B. King Co	1,741
Sailed east—	
Schooner William Booth	545
Schooner Jesse Hart, 2d	255
Schooner Centennial	115
Schooner Granite (Br.)	

Around Cape:	
Steamers	10
Schooners	4
Tugs	9
Barges	20
Total	43
Tonnage estimated	51,780

JANUARY 17, 1917.

BOSTON.

Arrived:	
Steamer Ontario from Baltimore, Mer. & Min. T.	3,099
Steamer Cretan from Philadelphia, Mer. & Min. T.	2,350
Steamer Newton from Sewalls Point, N. E. C. & C. Co.	5,194
Steamer Meteor from Sewalls Point, Pac. Coast Co.	2,301
Steamer H. M. Whitney from New York, Eastern S. S.	2,706
Tug Boxer—	
Barge Larimer, F. W. Munn	350
Barge Westmoreland, F. W. Munn	256
Steamer Harvey H. Brown from Norfolk	2,673
Steamed:	
Steamer Kershaw for Newport News, Mer. & Min. T.	2,599
Steamer Carolina (Sw.) for Philadelphia	5,017
Steamer City of Atlanta for Savannah, Ocean S. S.	5,433
Steamer Hampden for Baltimore, Coastwise S. S.	4,725
Steamer H. F. Dimock for New York, Eastern S. S.	2,625
Tug W. H. Yerkes, barge Oxford, Sus. Coal Co.	836
Highland Light, wind 4.30 p. m. NW., 25 miles; cloudy; smooth sea:	
Passed west, tug C. B. Sanford—	
Barge N. T. No. 3	700
Barge E. R. Haggett	700
Passed east, tug Swatara—	
Barge Suffolk, P. & R. R. R.	855
Barge Ephrata, P. & R. R. R.	954
Barge Spring, P. & R. R. R.	1,780
Chatham, wind 5 p. m. NW., strong; cloudy:	
Passed east—	
Schooner Wyoming	3,730
Tug Wyoming—	
Barge No. 702, Lehigh Valley R. R.	934
Barge No. 766, Lehigh Valley R. R.	800
Barge No. 705, Lehigh Valley R. R.	934
Nobska, wind 3.25 p. m. W., 18 miles; clear:	
Passed East—	
Tug Lenape—	
Barge Marion, P. & R. R. R.	954
Barge Tamenend, P. & R. R. R.	721
Barge Eagle Hill, P. & R. R. R.	911
Tug Carlisle—	
Barge Preston, P. & R. R. R.	855
Barge Tohickon, P. & R. R. R.	739
Barge Phoenix, P. & R. R. R.	901
Vineyard Haven:	
Arrived west, tug Cheektowaga—	
Barge No. 765, Lehigh Valley	800
Barge No. 785, Lehigh Valley	800
Barge No. 786, Lehigh Valley	800
Passed east—	
Steamer Howard, Mer. & Min. T. Co.	3,581
Tug Patience, towing 2 barges, F. W. Munn	1,400
Tug Gettysburg, towing 3 barges, P. & R. R. R.	2,100

Around cape:
- Steamers 12
- Schooners 1
- Tugs 10
- Barges 25

Total 48
Tonnage estimated 66,113

JANUARY 18, 1917.

BOSTON.

Arrived:
- Steamer James S. Whitney from New York, Eastern S. S. 2,707
- Steamer Grecian from Norfolk, Mer. & Min. T. Co. 2,827
- Steamer Norfolk from Jacksonville, Coastwise S. S. 3,521
- Tug Edgar F. Coney—
  - Barge Hawthorne, Erie R. R. 680
  - Barge Stroudsburg 693

Steamed:
- Tug Lehigh—
  - Barge No. 703, Lehigh Valley 934
  - Barge No. 707, Lehigh Valley 934
  - Barge No. 767, Lehigh Valley 800
- Steamer Cretan for Philadelphia, Mer. & Min. T. Co. 2,350
- Steamer Ontario for Norfolk, Mer. & Min. T. Co. 3,099
- Steamer Mariana for New York, N. Y. & Porto Rico 3,063
- Steamer Walter D. Noyes for Sewalls Point, Crowell & Thurlow 4,387
- Tug Lykens—
  - Barge Herndon, P. & R. R. R. 1,763
  - Barge Maple Hill, P. & R. R. R. 911
  - Barge Buck Ridge, P & R. R. R. 915
- Tug Standard—
  - Barge No. 5, Stand. T. Co 800
  - Barge No. 6, Stand. T. Co 800
  - Barge No. 124, Stand. T. Co 952
- Tug Watuppa, barge Tipton, Staples T. Co. 830

Highland Light, wind 4.50 p. m. WNW., 20 miles; cloudy; smooth sea.
Nobska, wind 1.30 p. m. W., 18 miles; clear.
Passed west, steamer Matoa.
Vineyard Haven, wind westerly, strong; clear; rough sea.
Arrived west, schooner Minne J. Dicks (Br.).
Arrived east, schooner Kate Jones.
Around cape:
- Steamers 8
- Schooners 2
- Tugs 5
- Barges 12

Total 27
Tonnage estimated 32,966

JANUARY 19, 1917.

BOSTON.

Arrived:
- Steamer Indian from Philadelphia, Mer. & Min. T. Co. 2,110
- Steamer Tuscan from Baltimore, Mer. & Min. T. Co. 2,415
- Steamer City of Augusta from Savannah, Ocean S. S. 2,869
- Steamer Berlin (Dan.) from Jucaro via Norfolk 1,634
- Steamer Corsica from Norfolk 2,364

Steamed:
- Steamer Grecian for Newport News, Mer. & Min. T. Co. 2,827
- Steamer Newton for Lamberts Point, N. E. C. & C. Co. 5,194
- Steamer Meteor for Sewalls Point, Pac. Coast Co. 2,301
- Steamer Harvey H. Brown, for Norfolk 2,673

Steamed—Continued.
Tug Charles P. Greenough—
Barge Lynn, N. E. C. & C. Co. 1,159
Barge Beattie, N. E. C. & C. Co. 1,117
Barge Providence, N. E. C. & C. Co. 1,159
Tug May—
Barge Ampere, D., L. & W. 698
Barge Riverside, Erie R. R. 863
Tug Swatara—
Barge Wiconisco, P. & R. R. R. 956
Barge Merriam, P. & R. R. R. 855
Barge Mahanoy, P. & R. R. R. 855
Tug Cumberland—
Barge No. 5, Cons. C. Co. 909
Barge No. 20, Cons. C. Co. 940
Tug Gettysburg—
Barge Paxinos, P. & R. R. R. 954
Barge Robesonia, P. & R. R. R. 955
Barge Temple, P. & R. R. R. 963
Tug Lenape—
Barge Macungie, P. & R. R. R. 956
Barge Manheim, P. & R. R. R. 955
Barge Neshaminy, P. & R. R. R. 721
Tug Nottingham—
Barge L. & W. No. 5, L. & W. C. Co. 685
Barge L. & W. No. 6, L. & W. C. Co. 685
Barge L. & W. No. 12, L. & W. C. Co. 862
Tug Savage—
Barge No. 7, L. & W. C. Co. 898
Barge No. 23, L. & W. C. Co. 1,035
Tug Plymouth, barge Hopatcong, D., L. & W. 988
Tug Mars—
Barge Harrisburg, F. W. Munn. 1,283
Barge Elk Garden, F. W. Munn. 847
Barge Charles F. Pritchard, F. W. Munn. 861
Steamer J. H. Devereux for Sewalls Point, Metro. C. Co. 1,618
Sailed west, schooner Ellen Little. 999
Highland Light, wind 5 p. m., NW., 25 miles; clear; choppy sea.
Chatham, wind NW., strong breeze; clear.
Passed west, steamer North Land, Eastern S. S. 3,282
Vineyard Haven:
Arrived west—
Tug Perth Amboy—
Barge No. 741, Lehigh Valley. 800
Barge No. 780, Lehigh Valley. 926
Barge No. 783, Lehigh Valley. 923
Tug Mercury—
Barge Albany, Erie R. R. 659
Barge Hackensack, Erie R. R. 875
Tug Western—
Barge Pilgrim, Lehigh C. & N. 967
Barge Nesquehoning, Lehigh C. & N. 967
Tug Standard II—
Barge S. F. No. 57, Stand. T. Co. 1,381
Barge S. F. No. 86, Stand. T. Co. 1,102
Arrived east, tug Lehigh—
Barge No. 703, Lehigh Valley. 934
Barge No. 707, Lehigh Valley. 934
Barge No. 767, Lehigh Valley. 800

Around cape:
Steamers. 11
Schooners. 1
Tugs. 15
Barges. 37

Total. 64
Tonnage, estimated. 61,710

JANUARY 21, 1917.

BOSTON.

Arrived:	
Steamer Transportation from Norfolk, Coastwise S. S	4,015
Steamer Coastwise from Newport News, Coastwise S. S	4,015
Steamer Nantucket from Norfolk, Mer. & Min T. Co	2,599
Steamer Everett from Newport News, N. E. C. & C. Co	5,107
Steamer Malden from Baltimore, N. E. C. & C. Co	5,107
Steamer Brandon from Baltimore, N. E. C. & C. Co	2,431
Tug Eastern, barge Harry F. Hooper	726
Steamed:	
Steamer Norfolk for Jacksonville, Coastwise S. S	3,521
Steamer Corsica for Norfolk	2,364
Tug Tacony—	
Barge Nanticoke, P. Dougherty	771
Barge Upton, Sus. Coal Co	843
Tug Edgar F. Coney—	
Barge Hattie, N. E. C. & C. Co	1,286
Barge Eugenia Hooper, N. E. C. & C. Co	730
Tug Carlisle—	
Barge Ephrata, P. & R. R. R	954
Barge Suffolk	855
Barge Beechwood	841
Vineyard Haven:	
Arrived west, tug Luckenbach No. 3—	
Barge Old Dominion, Luckenbach	1,802
Barge C. F. Sargent, Luckenbach	1,689
Arrived east, tug Richmond, barge Iowa, Seaboard T. Co	1,606
Passed west—	
Steamer Frieda, Union Sulphur Co	2,993
Steamer Santurce, N. Y. & Porto Rico	1,836
Schooner Ellen Little	.....
Steamed east—	
Tug Cheektowage—	
Barge No. 765, Lehigh Valley	800
Barge No. 785, Lehigh Valley	800
Barge No. 786, Lehigh Valley	900
Tug Plymouth—	
Barge Allentown, Lehigh C. & N	842
Barge Canisteo, Lehigh C. & N	671
Tug Patience—	
Barge Harrisburg, F. W. Munn	1,283
Barge G. R. Stetson	.....
Tug Monocacy—	
Barge Richardson, P. & R. R. R	693
Barge Langhorne, P. & R. R. R	955
Barge Paxtang, P. & R. R. R	954
Around cape:	
Steamers	10
Schooners	1
Tugs	10
Barges	21
Total	42
Tonnage, estimated	53,989

JANUARY 22, 1917.

BOSTON.

Arrived:	
Steamer Arlington from Lamberts Point, N. E. C. & C. Co	2,431
Steamer Dorchester from Baltimore, Mer. & Min. T. Co	2,537
Steamer Lexington from Philadelphia, Mer. & Min. T. Co	2,092
Steamer Nacoochee from Savannah, Ocean S. S	2,680
Tug Watuppa—	
Barge Easton, Staples T. Co	531
Barge Remus, Staples T. Co	531

Arrived—Continued.
Tug Luckenbach No. 1—
Barge J. B. Walker, Luckenbach 2,136
Barge City of Washington, Luckenbach 2,410
Steamed:
Steamer Chaco (Arg.) for Philadelphia .....
Steamer Malden for Baltimore, N. E. C. & C. Co 5,107
Steamer Nantucket for Baltimore, Mer. & Min. T. Co 2,599
Steamer Coastwise for Sewalls Point, Coastwise S. S 4,015
Steamer Dochra for New York, La Plata S. S 4,309
Tug Waltham, barge Fall River, Staples T. Co 1,759
Tug Watuppa, barge Cohocton, D. L. & W 671
Highland Light, wind 5 p. m. NW., 20 miles; cloudy; smooth sea.
Nobska, wind WSW., 16 miles; light fog.
Vineyard Haven, wind W.; fresh breeze; cloudy; choppy sea:
Arrived west—
Steamer Inland .....
Tug Luckenbach No. 2, barge West Point, Luckenbach 1,213
Passed west, Steamer Ruth, A. H. Bull S. S 3,102

Around Cape:
Steamers 11
Tugs 5
Barges 7

Total 23

Tonnage, estimated 38,113

JANUARY 23, 1917.

BOSTON.

Arrived:
Steamer Hesperides (Br.) from Buenos Ayres 3,393
Steamer Panaman (Br.) from Buenos Ayres .....
Steamer Ontario from Norfolk, Mer. & Min. T. Co 3,099
Steamer Melrose from Newport News, N. E. C. & C. Co 5,107
Steamer Walter D. Noyes, Crowell & Thurlow 4,387
Steamed:
Steamer Chimu (Br.) for New York, N. Y. & P. A. C. S. S. Co 4,250
Steamer Clan Macnab (Br.) for Baltimore, Cayzer, Irvine & Co 4,675
Steamer Nacoochee for Savannah, Ocean S. S 2,680
Steamer Dorchester for Norfolk, Mer. & Min. T. Co 2,537
Steamer Lexington for Philadelphia, Mer. & Min. T. Co 2,092
Steamer Brandon for Baltimore, N. E. C. & C. Co 2,431
Tug Plymouth—
Barge Henry Failing, Scully 1,976
Barge Rondout, Penna. Coal Co 831
Barge Stroudsburg, Penna. Coal Co 693
Tug Luckenbach—
Barge Gen. Knox, Luckenbach 1,587
Barge Washington, Luckenbach 1,724
Steamer Maplemoor (Br.) for Baltimore .....
Steamer Berlin (Dan.) for Norfolk 1,634
Steamer Bristol for Norfolk .....
Steamer Everett for Newport News, N. E. C. & C. Co 5,130
Highland Light, wind 5 p. m., W., 5 miles; clear; smooth sea.
Chatham, wind W., light breeze; clear.
Passed west, tug Gypsum Queen, towing 3 barges 2,400
Vineyard Haven:
Steamed east—
Tug Gwalia—
Barge Harry F. Hooper 726
Barge Coastwise 800
Tug Standard II—
Barge No. 57, Stand. T. Co 1,381
Barge No. 86 1,102
Barge No. 123 950

Around Cape:
- Steamers 15
- Tugs 5
- Barges 13

Total 33

Tonnage, estimated 55,585

JANUARY 24, 1917.

BOSTON.

Arrived:
- Steamer Cretan from Philadelphia, Mer. & Min. T 2,350
- Steamer Selwyn Eddy from Norfolk, Mer. & Min. T 2,846
- Steamer James S. Whitney from New York, Eastern S. S 2,707
- Steamer Gloucester from Baltimore, Mer. & Min. T 2,541
- Steamer Saramacca from New York, Saramacca S. S 3,283
- Tug Paoli, towing barges from South Amboy .....

Steamed:
- Steamer Ontario for Newport News, Mer. & Min. T Co 3,099
- Steamer City of Madrid (Br.) for New York .....
- Steamer Transportation for Baltimore, Coastwise S. S 4,015
- Steamer H. M. Whitney for New York, Eastern S. S 2,706
- Tug Patience—
  - Barge Larimer .....
  - Barge Westmoreland, F. W. Munn 256
- Tug Neptune, barge Lake Michigan .....
- Tug Monocacy—
  - Barge Temple, P. & R R R 963
  - Barge Eagle Hill, P. & R. R. R 911
  - Barge Franklin, P. & R. R. R 910

Highland Light, wind 4.30 p. m., SW., 7 miles; very hazy; smooth sea:
- Passed east, steamer Newton, N. E. C. & C. Co 5,194
- Passed west—
  - Steamer Arlington, N. E. C. & C. Co 2,431
  - Tug Piedmont—
    - Barge No. 19, Cons. C. Co 932
    - Barge No. 25 1,566

Chatham, wind WSW.; light breeze; cloudy:
- Passed west, tug Boxer—
  - Barge Delaware, Southern T. Co 524
  - Barge Wilmington 600

Nobska, wind S.; 3 miles; cloudy:

Vineyard Haven, wind westerly; moderate; smooth sea; clear:
- Arrived west—
  - Tug Nottingham, towing 3 barges 2,400
  - Tug Pallas, towing 2 barges 1,600

Around cape:
- Steamers 11
- Tugs 8
- Barges 15

Total 34

Tonnage, estimated 41,834

JANUARY 25, 1917.

BOSTON.

Arrived:
- Steamer Kentuckian from Buenos Aires, Amer.-Hawaiian S. S 6,606
- Steamer Westoil from Buenos Aires .....
- Steamer Tuscan from Norfolk, Mer. & Min. T. Co 2,415
- Steamer Meteor from Sewalls Point, Pacific Coast. Co 2,301
- Steamer H. F. Dimock from New York, Eastern S. S 2,625
- Steamer Middlesex from Norfolk, Coastwise Trans 4,727

Arrived—Continued.
Tug Neponset—
Barge Lansford, Lehigh C. & N..... 830
Barge Easton, Lehigh C. & N..... 830
Steamed:
Steamer Gloucester for Norfolk, Mer. & Min. T. Co..... 2,541
Steamer Cretan for Philadelphia, Mer. & Min. T. Co..... 2,350
Steamer Melrose for Sewalls Point, N. E. C. & C. Co..... 5,107
Steamer Panaman for New York, Amer.-Hawaiian S. S..... 6,649
Steamer Cretic (Br.) for New York.....
Tug Luckenbach No. 2 for Providence.....
Tug Gwalia—
Barge Clara, N. E. C. & C..... 828
Barge Emelie, N. E. C. & C..... 1,069
Steamer Selwyn Eddy for Norfolk, Mer. & Min. T..... 2,846
Highland Light, wind 4.45 p. m. W., 3 miles; cloudy and hazy; smooth sea.
Nobska, wind 4.20 p. m. WNW., light breeze; cloudy:
Passed east, steamer Katahdin, Clyde S. S..... 2,696
Vineyard Haven, wind variable, light; smooth sea; clear:
Arrived west—
Tug Essex, barge Chenango, D. L. & W..... 671
Tug Ontario—
Barge Forest Belle, N. Y. O. & W. R. R..... 1,333
Barge Smyrna, N. Y. O. & W. R. R..... 741
Barge Cadosia, N. Y. O. & W. R. R..... 756
Tug Tamaqua—
Barge Mingo, P. & R. R. R..... 954
Barge Bear Ridge, P. & R. R. R..... 910
Barge Skippack, P. & R. R. R..... 739
Schooner Albert H. Willis..... 567
Passed east, steamer City of Atlanta, Ocean S. S..... 5,433

Around cape:
Steamers..... 13
Schooners..... 1
Tugs..... 6
Barges..... 11

Total..... 31

Tonnage, estimated..... 56,524

JANUARY 26, 1917.

BOSTON.

Arrived:
Steamer Wagama (Nor.) from Buenos Ayres.....
Steamer Grecian from Norfolk, Mer. & Min. T. Co..... 2,827
Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
Steamer Hampden from Baltimore, Coastwise S. S..... 4,725
Steamed:
Steamer Julia Luckenbach for New York, Luckenbach..... 3,100
Steamer Tuscan for Baltimore, Mer. & Min. T. Co..... 2,415
Steamer Walter D. Noyes for Newport News, Crowell & Thurlow..... 4,387
Tug Luckenbach No. 2—
Barge J. B. Walker, Luckenbach..... 2,136
Barge City of Washington, Luckenbach..... 2,410
Tug Paoli—
Barge Haverford, Sus. Coal Co..... 678
Barge Oxford, Sus. Coal Co..... 836
Barge Coaldale, Lehigh C. & N..... 831
Tug Western—
Barge Ellenville, N. Y., O. & W. R. R..... 858
Barge Pilgrim, N. Y., O. & W. R. R..... 1,215
Barge Sidney, N. Y., O. & W. R. R..... 745

Steamed—Continued.
Tug Lehigh—
Barge No. 742, Lehigh Valley..... 900
Barge No. 765, Lehigh Valley..... 800
Barge No. 766, Lehigh Valley..... 800
Sailed: Schooner Wyoming for Norfolk.....
Highland Light, wind NW., 20 miles; hazy; smooth sea:
Passed east—Steamer Binghamton..... 2,143
Chatham, wind NW., fresh breeze; partly cloudy and hazy:
Passed east—
Schooner Stanley M. Seaman..... 1,060
Tug Standard—
Barge No. 5, Stand. T. Co..... 800
Barge No. 6, Stand. T. Co..... 800
Tug Lenape—
Barge Rutherford, P. & R. R. R..... 955
Barge Ontelaunee, P. & R. R. R..... 739
Barge Draper, P. & R. R. R..... 855
Nobska, wind WNW., 10 miles; cloudy:
Vineyard Haven, wind NW., fresh; choppy sea; snow squalls:
Arrived west—
Schooner Jessie Ashley (Br.)..... 143
Tug John A. Hughes, barge I. D. Fletcher, Coast T. Co..... 1,034

Around Cape:
Steamers..... 8
Schooners..... 3
Tugs..... 7
Barges..... 17

Total..... 35

Tonnage, estimated..... 39,202

JANUARY 28, 1917.

BOSTON.

Arrived:
Steamer Otter (Nor.) from Matanzas.....
Steamer Clan Robertson (Br.) from Calcutta via Norfolk..... 4,826
Steamer Kershaw from Norfolk, Mer. & Min. T. Co..... 2,599
Steamer Corsica from Norfolk..... 2,364
Steamer Lexington from Philadelphia, Mer. & Min. T. Co..... 2,092
Steamer Tampico from Philadelphia, Pac. Coast Co..... 2,251
Steamer Mohawk from Grasselli, N. J., Clyde S. S..... 4,623
Tug Swatara—
Barge Molino, P. & R. R. R..... 954
Barge Glendower, P. & R. R. R..... 855
Barge Leesport, P. & R. R. R..... 963
Tug Conestoga—
Barge Lincoln, P. & R. R. R..... 855
Barge Monitor, P. & R. R. R..... 955
Barge Hammond, P. & R. R. R..... 693
Vineyard Haven, wind easterly, moderate; smooth sea; snowing:
Steamed west, tug Lenape—
Barge Tamenend, P. & R. R. R..... 721
Barge Oak Hill, P. & R. R. R..... 910
Barge Brookside, P. & R. R. R..... 841
Arrived west, tug Gypsum Queen—
Barge Glooscap.....
Barge Ontario.....
Tug Cheektowaga, towing 3 barges, Lehigh Valley..... 2,400
Schooner Revenue (Br.).....
Arrived east, schooner Mary E. Morse..... 644

Around Cape:
Steamers..... 7
Schooners..... 2
Tugs..... 5
Barges..... 14

Total..... 28

Tonnage, estimated..... 29,548

JANUARY 29, 1917.

BOSTON.

Arrived:
Steamer Manitowoc from Buenos Aires.
Steamer City of Augusta from Savannah, Ocean S. S..... 2,869
Steamer Malden from Baltimore, N. E. C. & C..... 5,107
Steamer Nantucket from Baltimore, Mer. & Min. T..... 2,599
Steamer J. H. Devereux from Sewalls Point, Metro. Coal..... 1,618
Steamer Bristol from Norfolk.....
Steamer Everett from Newport News, N. E. C. & C. Co..... 5,130
Steamer Harvey H. Brown from Norfolk..... 2,673
Steamed:
Steamer City of Rangoon (Br.) for New York.
Steamer Huron for Sewalls Point, Clyde S. S..... 3,318
Steamer Coastwise for Sewalls Point, Coastwise T..... 4,015
Steamer Kershaw for Baltimore, Mer. & Min. T..... 2,599
Steamer Philadelphia for New York..... 1,306
Tug Conestoga—
Barge R. & R. L. No. 1, R. & R. L. Co..... 1,120
Barge Hawthorne, Erie R. R..... 680
Tug Standard—
Barge No. 5, Stand. T. Co..... 800
Barge No. 6, Stand. T. Co..... 800
Tug Wyoming—
Barge No. 700, Lehigh Valley..... 934
Barge No. 701, Lehigh Valley..... 934
Barge No. 786, Lehigh Valley..... 900
Highland Light, wind 5 p. m. S.; 5 miles; cloudy and foggy; smooth sea.
Chatham, wind 5 p. m. S.; very light breeze; cloudy and hazy.
Passed east, tug Prudence, barge Georgia, P. Dougherty..... 1,318
Vineyard Haven:
Arrived west, tug Luckenbach No. 4, towing 2 barges, Luckenbach..... 1,600
Passed east, steamer Brandon, N. E. C. & C. Co..... 2,431

Around Cape:
Steamers..... 14
Tugs..... 5
Barges..... 10

Total..... 29

Tonnage, estimated..... 42,751

JANUARY 30, 1917.

BOSTON.

Arrived:
Steamer Gloucester from Norfolk, Mer. & Min. T. Co..... 2,541
Steamer Bay View from Sewalls Point, White Oak T. Co..... 1,399
Tug Sea King—
Barge Helen, N. E. C. & C. Co..... 1,285
Barge Irene, N. E. C. & C. Co..... 1,206
Steamer Ontario from Baltimore, Mer. & Min. T. Co..... 3,099

Steamed:	
Steamer Balileo (Br.) for England, via New York	
Steamer Corsica for Norfolk	2,364
Steamer Harvey H. Brown for Norfolk	2,673
Steamer Nantucket for Norfolk, Mer. & Min. T. Co	2,599
Steamer Lexington for Philadelphia, Mer. & Min. T. Co	2,092
Steamer City of Augusta for Savannah, Ocean S. S	2,869
Steamer Hampden for Baltimore, Coastwise S. S	4,725
Steamer Everett for Newport News, N. E. C. & C. Co	5,130
Steamer Tampico for Newport News, Pac. Coast Co	2,251
Steamer Malden for Baltimore, N. E. C. & C. Co	5,107
Tug Atkins Hughes, barge I. D. Fletcher, Coast T. Co	1,034
Tug Joseph O'Riorden, barge John C. Fields	444
Tug Wm. H. Yerkes, barge Rose M. Feeney	515
Tug Nottingham—	
Barge L. & W. B. Co. No. 2, L. & W. B. Co	958
Barge L. & W. B. Co. No. 9, L. & W. B. Co	685
Barge L. & W. B. Co. No. 15, L. & W. B. Co	953
Tug Perth Amboy—	
Barge No. 741, Lehigh Valley	900
Barge No. 780, Lehigh Valley	926
Barge No. 785, Lehigh Valley	900
Highland Light, wind 5 p. m. NW., 22 miles; clear; smooth sea.	
Nobska, wind NW., 5 miles; fog.	
Vineyard Haven, wind westerly; moderate; clear.	
Steamed east, tug Honeybrook, towing 3 barges, L. & W. B. Co	2,400
Arrived west—	
Tug Murrell—	
Barge Alice, N. E. C. & C. Co	640
Barge Northern No. 6	
Barge Sweetser Linthicum	
Tug Jack T. Scully, barge I., F. Chapman Scully	2,146
Passed west, steamer Huron, Clyde S. S	3,318
Passed east—	
Tug Charles P. Greenough, towing 3 barges	2,100
Tug Luckenbach, towing 1 barge	700
Around Cape:	
Steamers	13
Tugs	10
Barges	22
Total	45
Tonnage, estimated	57,959

JANUARY 31, 1917.

BOSTON.

Arrived:	
Steamer Cretan from Philadelphia, Mer. & Min. T	2,350
Steamer Arlington from Baltimore, N. E. C. & C. Co	2,431
Steamer Newton from Lamberts Point, N. E. C. & C. Co	5,194
Steamer Melrose from Sewalls Point, N. E. C. & C. Co	5,107
Steamer Walter D. Noyes from Newport News, Crowell & Thurlow	4,387
Steamer H. F. Dimock from New York, Eastern S. S	2,625
Tug Confidence, barge Helen Woods	505
Steamed:	
Steamer Corsica for Norfolk	2,364
Steamer Gloucester for Baltimore, Mer. & Min. T	2,541
Steamer Westoil for New York	
Steamer Mohawk for Chrome, N. J., Clyde S. S	4,623
Steamer J. H. Devereux for Sewalls Point, Metro. Coal Co	1,618
Steamer James S. Whitney for New York, Eastern S. S	2,707
Steamer Ottar (Nor.) for Baltimore	3,238
Steamer Meteor for Newport News, Pac. Coast Co	2,301
Steamer Montoso for New York, N. Y. & Porto Rico Co	3,063
Steamer Bristol for Norfolk	

Sailed, schooner Margaret Thomas for Newport News, Thurlow..... 1,427
Highland Light, wind 4.45 p. m., NW., 8 miles; thick snow; sea smooth:
Passed east—
Steamer Herman Winter, Eastern S. S..... 2,625
Tug Plymouth—
Barge Troy, Erie R. R..... 660
Barge Benefactor, D. L. & W..... 827
Barge Shickshinny, D. L. & W..... 836
Chatham, wind W., light; cloudy:
Passed east, tug Watuppa—
Barge Brockton, Staples T. Co..... 567
Barge Potomac, P. Dougherty Co..... 823
Nobska:
Passed east, tug Carlisle—
Barge Manheim, P. & R. R. R..... 955
Barge Buck Ridge, P. & R. R. R..... 915
Barge Bast, P. & R. R. R..... 693
Vineyard Haven, wind a. m., NW., moderate; p. m. easterly, light; smooth sea; cloudy:
Arrived west—
Tug May—
Barge Ampere, D. L. & W..... 698
Barge Chemung, D. L. & W..... 671
Tug Gettysburg—
Barge Silverbrook, P. & R. R. R..... 904
Barge Yardley, P. & R. R. R..... 963
Barge Pocopson, P. & R. R. R..... 721
Tug Valley Forge—
Barge Mahanoy, P. & R. R. R..... 855
Barge Neshaminy, P. & R. R. R..... 721
Barge Merriam, P. & R. R. R..... 855
Tug Monocacy—
Barge Herndon, P. & R. R. R..... 1,763
Barge Tulpehocken, P. & R. R. R..... 721
Barge Cleona, P. & R. R. R..... 956
Tug Savage, towing 2 barges, Cons. C. Co..... 1,800
Sailed east, schooner Charles E. Wyman..... 234
Around cape:
Steamers..... 17
Tugs..... 10
Barges..... 22
Schooners..... 2

Total..... 51

Tonnage estimated..... 67,244

FEBRUARY 2, 1917.

No report.
Highland Light, weather 5 p. m., NE., 37 miles; thick snow and sleet.
Chatham, weather 5 p. m., wind NE., fresh breeze; C. and R.:
Passed tug Fred E. Richards, towing barges R. & R. L. Nos. 3 and 4, Rockland & Rockport Lime Co..... 3,000
Nobska, wind east 12 miles; R.; anchored:
Tug Tamaqua, towing barges—
Mingo, P. & R. R. R..... 1,550
Buckridge, P. & R. R. R..... 1,550
Paxtang, P. & R. R. R..... 1,550
Tug Catawissa, towing barges—
Kimberton, P. & R. R. R..... 1,550
Wiconisco, P. & R. R. R..... 1,550
Molino, P. & R. R. R..... 1,550
Vineyard Haven, wind NE., fresh; thick and raining:
Anchored—
Tug Ontario, towing barges—
Cadosia, N. Y. O. & W. R. R..... 1,275
Pilgrim, N. Y. O. & W. R. R..... 2,250
Elmville, N. Y. O. & W. R. R..... 1,600

Vineyard Haven—Continued.
Anchored—Continued.
Tug Perth Amboy, towing barges—
784, Lehigh Valley R. R..... 1,625
701, Lehigh Valley R. R..... 1,620
706, Lehigh Valley R. R..... 1,620
Schooners Edward E. Briry, Lydia H. Roper.
Steamed—
Tug Carlisle, towing barges—
Draper, P. & R. R. R..... 1,450
Robsonia, P. & R. R. R..... 1,550
Pickering, P. & R. R. R..... 1,175
Schooner Childe Harold.
Around cape:
Schooners..... 3
Tugs..... 6
Barges..... 17
Tonnage, about..... 26,460
East bound:
Tug Cheektowaga—
Barge 707, L. V. R. R..... 1,620
Barge 765, L. V. R. R..... 910
Barge 780, L. V. R. R..... 1,625
Tug May, with barges—
Chemung, D. L. & W..... 1,020
Tamaqua, L. C. & N. Co..... 1,200
Allentown, L. C. & N. Co..... 1,200
7,575
Provincetown:
Tug Wyoming—
Barge 703, L. V. R. R..... 1,620
Barge 740, L. V. R. R..... 1,210
Barge 741, L. V. R. R..... 1,210
Vineyard Haven:
Arrived tug Nemasket—
Barge R. & R. L. No. 2, Staples..... 1,500
Barge R. & R. L. No. 6..... 1,500
7,040

In canal:		Around cape:	
Tugs	2	Tugs	2
Barges	6	Barges	5
Tonnage	7,575	Tonnage	7,040

FEBRUARY 4, 1917.

Steamed, tug Wm. H. Yerkes:
Barge Allentown, C. W. Chadwick Co..... 1,200
Barge Tamaqua..... 1,200
Passed Highland Light, weather B., W. 18 miles:
Tug Tacony—
Barge Musconectong, C. W. Chadwick Co..... 1,375
Barge Stratford..... 1,300
Barge Tobyhanna..... 1,350
Passed Chatham, weather B., W. fresh:
Tug Paoli—
Barge Oxford, Susquehanna Coal Co..... 1,200
Barge Upton..... 1,200
Tug Conestoga—
Barge Beechwood, Phila. & Read. R. R..... 1,250
Barge Cleona..... 1,350
Barge Tamanent..... 1,175
Provincetown:
Steamed, tug Wyoming—
Barge 740, Lehigh Valley R. R..... 1,210
Barge 703..... 1,620
Barge 741..... 1,210

Vineyard Haven, weather B., W. moderate
Arrived—
Schooner Conrad S. (Br.).
Tug towing barge Spring, Phila. & Read. R. R. 3,000
Tug Honeybrook, towing three barges, L. & W. Coal Co. 3,600
Tug Nemasket—
Barge R. & R. L. Co. 2, Rock. & Rock. Lime Co. 1,500
Barge Rockland 1,500
Barge No. 6 1,500
Sailed, schooner Rosalie Belliveau.

In canal:		Around cape:	
Tug	1	Tugs	7
Barges	2	Barges	18
Tonnage	2,400	Schooners	2
		Tonnage, about	26,000

FEBRUARY 6, 1917.

Tug Cheektowaga:
Barge 789, L. V. R. R. 900
Barge Hauto, L. C. & N. Co. 1,200
Barge Lansford, L. C. & N. Co. 1,200
Tug Nemasket, Staples 220
Tug Petrel:
Barge Hackensack, Erie R. R. 1,550
Barge Hawthorne, Erie R. R. 1,140
Barge Dunmore, Erie R. R. 960
Schooner Manie Saunders.
Lighter John Henry.
Barge Chemung, C. W. Chadwick & Co. 1,020
8,190

Vineyard Haven, weather C.; wind S., light breeze:
Arrived—
Schooner Rebecca M. Walls.
Schooner J. Holmes Birdsall.
Tug Gwalia, barges Occidental and Ivie, Seaboard Trans. Co. 2,450

Cape Cod Canal:		Around cape:	
Tugs	3	Tug	1
Barges	7	Barges	2
Schooner	1	Schooners	2
Lighter	1		
Total	12	Total	5
Tonnage	8,190	Tonnage	2,450

FEBRUARY 7, 1917.

Tug Wm. H. Yerkes towing barge Nesquehoning 1,200
Passed Highland light, weather C.; W. 24 miles:
Tug Fred E. Richards—
Barge R. & R. L. Co. No. 1, R. & R. Lime Co. 1,500
Barge R. & R. L. Co. No. 5, R. & R. Lime Co. 1,500
Barge Canisteo, C. W. Chadwick 1,020
Tug Paoli—
Barge Waverly, C. W. Chadwick 1,800
Barge Montauk, C. W. Chadwick 1,500
Passed Chatham, weather M.; W. strong breeze:
Tug Nemasket, barge Chatham, Staples T. Co. 3,350
Tug Gwalia—
Barge Salem, Shawmut S. S. Co. 2,650
Barge Occidental, Seaboard T. Co. 2,450
Tug Germantown—
Barge Glendower, Reading 1,450
Barge Maple Hill, Reading 1,550
Barge Ontelanee, Reading 1,175

Passed Nobska, weather C.; W. 30 miles:
- Tug Catawissa—
  - Barge Oley, Reading 3,000
  - Barge Macungie, Reading 1,550
  - Barge Cacoosing, Reading 1,175
- Tug Lykens—
  - Barge Moselem, Reading 1,550
  - Barge Suffolk, Reading 1,450
  - Barge Bear Ridge, Reading 1,550
- Tug Western—
  - Barge Forest Belle, N. Y. O. & W. R. R 2,250
  - Barge Liberty, N. Y. O. & W. R. R 1,600
  - Barge Smyrna, N. Y. O. & W. R. R 1,275

Vineyard Haven, weather B.; W. strong:
- Arrived tug Security—
  - Barge No. 57, Standard Oil Co 1,500
  - Barge No. 86, Standard Oil Co 1,500
  - Barge No. 123, Standard Oil Co 1,500
- Sailed schooner Conrad S. (Br.).

In canal:		Around cape:	
Tug	1	Tugs	9
Barge	1	Barges	23
Tonnage about	1,200	Schooner	1
		Tonnage about	40,000

FEBRUARY 8, 1917.

Tug Pejepscot, towing—
- Barge S. T. Co. No. 1, Sagadohoc Tow. Co. (about) 1,200
- Barge S. T. Co. No. 3 (about) 1,200

2,400

Passed Highland light, weather B.; NW., 12 miles:
- Tug Boxes—
  - Barge Beechwood, Reading 1,250
  - Barge Cleona, Reading 1,550
  - Barge Pocopson, Reading 1,175
- Tug Carlisle—
  - Barge Herndon, Reading 3,000
  - Barge Pickering, Reading 1,175
  - Barge Henry Clay, Reading 1,150
- Tug Plymouth—
  - Barge L. & W. No. 10, L. & W. Coal Co 1,500
  - Barge L. & W. No. 11 1,500
  - Barge L. & W. No. 14 1,500

Passed Chatham, weather C.; NW., light:
- Tug Chas. W. Parker, jr.—
  - Barge Ivie, N. E. Coal & Coke Co 2,600
  - Barge Providence, Shawmut S. S. Co 2,650
- Tug Chas. P. Greenough—
  - Barge Annie, N. E. Coal & Coke Co 1,950
  - Barge Irene 2,200

Vineyard Haven, weather B.; NW., strong to light:
- Arrived—
  - Tug Covington—
    - Barge Idaho, Seaboard Trans. Co 2,300
    - Barge Geo. B. Skolfield, Seaboard Trans. Co 2,450
  - Tug Savage—
    - Barge No. 7, L. Coal & Nav. Co 1,100
    - Barge No. 18, L. Coal & Nav. Co 1,500
    - Barge No. 21, L. Coal & Nav. Co 1,500
  - Tug Walter A. Luckenbach, towing 2 barges, Luck. S. S. Co. (about). 3,000
- Passed—
  - Tug International—
    - Barge Barry, Reading 1,550
    - Barge Tabor, Reading 1,550
    - Barge Preston, Reading 1,450

Vineyard Haven—Continued.
Passed—Continued.
Tug Nottingham, towing 3 barges, L. Coal & Nav. Co. (about)..... 4,500
Tug Patience, barge Reading, F. W. Munn, Philadelphia..... 2,100

46,200

In canal:		Around cape:	
Tug	1	Tugs	11
Barges	2	Barges	27
Tonnage about	2,400	Tonnage about	46,200

FEBRUARY 9, 1917.

Tug Hugh Ross, barge Coaldale, C. W. Chadwick Co..... 1,200
Tug Dauntless, barge No. 7..... 1,000
Tug Wyoming—
Barge 742, Lehigh Valley R. R..... 1,210
Barge 788, Lehigh Valley R. R..... 925
Barge 702, Lehigh Valley R. R..... 1,620
Passed Highland Light, Weather C., NW., 15 miles:
Tug Valley Forge—
Barge Spring, Reading..... 3,000
Barge Bethayres, Reading..... 1,550
Barge Wisconisco, Reading..... 1,550
Vineyard Haven:
Tug Lenape—
Barge Robesonia, Reading..... 1,550
Barge Draper, Reading..... 1,450
Barge Richardson, Reading..... 1,025
Tug Ontario—
Barge Sidney, N. Y. O. & W. R. R..... 1,275
Barge Pilgrim, N. Y. O. & W. R. R..... 2,250
Barge Metacomet, N. Y. O. & W. R. R..... 1,450
Tug Gwalia—
Barge Beattie, N. E. Coal & Coke..... 1,950
Barge Portsmouth, Shawmut S. S. Co..... 2,650

19,700

In canal:		Around cape:	
Tugs	3	Tugs	4
Barges	5	Barges	11
Tonnage about	6,000	Tonnage about	19,700

FEBRUARY 10, 1917.

No report.
Passed Highland Light, weather B., NW., 20 miles:
Tug Prudence—
Barge Paxtang, Reading..... 1,550
Conewago, Reading..... 1,550
Tamanend, Reading..... 1,175
Schooner Barbara.
Passed Chatham, weather B., SW., fresh:
Tug Piedmont—
Barge 23, L. C. & Nav. Co. (about)..... 1,200
Barge 24, (about)..... 1,200
Tug Mars, barge Hampshire, F. W. Munn, Philadelphia..... 1,475

Tug Lenape, barges Draper, Richardson, and Robesonia, Reading. (This tow arrived Vineyard Haven Feb. 9 and passed Chatham at 2.20 p. m. Feb. 10.)
Tug Western, barges Forest Belle, Liberty, and Smyrna. (This tow passed Nobska Feb. 7, and passed Chatham 4.20 p. m. Feb. 10.)
Tug Savage, barges 7, 18, and 21. (This tow arrived Vineyard Haven Feb. 8, and passed Chatham 4.20 p. m. Feb. 10.)

Vineyard Haven, weather B., W. fresh:
Arrived and steamed tug Valley Forge, barges Spring, Bethayres, and Wiconisco, Reading. (This tow passed Highland Light Feb. 9.)
Arrived tug Boswell, barge Harvard, N. E. C. & C. Co..... 2,000
Steamed—
Tug Covington, barges Geo. R. Skofield and Idaho. (This tow arrived Vineyard Haven Feb. 8.)
Tug Walter A. Luckenbach, towing 2 barges. (This tow arrived at the Vineyard Feb. 8.)
Tug Paoli, barges Montauk and Waverly. (This tow passed Highland Light Feb. 7.)
Plymouth, barges 10, 11, and 14. (This tow passed Highland Light Feb. 8.)
Tug Ontario, barges Pilgrim, Metacomet, and Sidney. (This tow arrived Vineyard Feb. 9.)
Tug Gwalia, barges Beattie and Portsmouth. (This tow arrived Vineyard Feb. 9.)
Tug Tacony, towing 3 barges, Sus. Coal Co..... 4,500

14,650

In canal:	Around cape:	
No report.....	Schooners.....	1
	Tugs.....	5
	Barges.....	10
	Tonnage (about).....	14,650

FEBRUARY 13, 1917.

Arrived, steamer Henlopen.
Vineyard Haven:
Arrived. tug M. Moran—
Barge Grace, McWilliams Bros..... 725
Barge Edith, Thames Towboat Co..... 850

1,575

In canal:		Around cape:	
Steamer.....	1	Tug.....	1
		Barges.....	2
		Tonnage.....	1,575

FEBRUARY 14, 1917.

Tug Narragansett.
Fire Island:
Bound east, tug Tamaqua and 3 barges, Reading.
Highland Light, weather NE., 35 miles; snow squalls; rough sea.
Chatham, NE., strong breeze; snow squalls.
Nobska, N., 12 miles; light snow.

FEBRUARY 15, 1917.

Arrived:
Tug Pejepscot, C. W. Chadwick.....
Tug Petrel towing 3 barges, Erie R. R. (about)..... 3,600
Eastbound, tug Scranton—
Barge Hopatcong, C. W. Chadwick..... 1,375
Barge Tunkhannock, C. W. Chadwick..... 1,350
Westbound, tug Perth Amboy towing 3 barges, Lehigh Valley..... 3,600
Eastbound, tug Atkins Hughes towing 2 barges..... 2,400

12,325

BOSTON.

Arrived tug Conestoga, barges Ephrata, Yardley, and Neshaming. (This tow passed through canal.)
Left Boston, tug Conestoga towing barges Barry, Preston, and Tabor.
Passed Highland Light, weather NE., 15 miles; C.:
Tug Piedmont—
Barge No. 8, L. Coal & Nav. Co..... 1,200
Barge No. 18, L. Coal & Nav. Co..... 1,200

Passed—Continued.
Tug Carlisle—
Barge Kimberton, Reading..... 1,550
Barge Marion..... 1,550
Barge Saucon..... 1,550
Tug Nemasket, barge Chatham, Staples..... 3,350
Passed Chatham, weather NE., light; C.:
Tug Covington (calls at New Bedford for barge Pittston and orders, Seaboard Trans. Co.).
Passed Nobska, weather ENE., 5 miles; B.:
Tug Fred E. Richards—
Barge Delawanna, C. W. Chadwick..... 2,120
Barge R. & R. L. Co. 5..... 1,500
Barge Pequest..... 1,375
Anchored off Falmouth:
Tug Tamaqua—
Barge Eagle Hill, Reading..... 1,550
Barge Franklin, Reading..... 1,550
Barge Bast, Reading..... 1,025
(This is the tow that left Philadelphia with tug Conestoga for test.)
Tug Manocacy—
Barge Tohickon, Reading..... 1,175
Barge Cumru, Reading..... 3,000
Barge Oak Hill, Reading..... 1,550
Tug Gettysburg—
Barge Brookside, Reading..... 1,250
Barge Mahanoy, Reading..... 1,450
Barge Merriam, Reading..... 1,450
Vineyard Haven, weather a. m., NE., moderate, S; weather p. m., B.:
Arrived—
Tug Honeybrook—
Barge No. 1, L. Coal & Nav. Co..... 1,500
Barge No. 8, L. Coal & Nav. Co..... 1,500
Barge Wilkesbarre, L. Coal & Nav. Co..... 2,200
Tug Standard—
Barge No. 86, Standard Oil Co..... 1,500
Barge No. 128, Standard Oil Co..... 1,500
Tug Lehigh—
Barge No. 740, Lehigh Valley R. R..... 1,210
Barge No. 703, Lehigh Valley R. R..... 1,620
Barge No. 766, Lehigh Valley R. R..... 910
Schooner Henry O. Barrett.
Sailed, schooner May V. Nevill.

In canal:		Around cape:	
Tugs	5	Tugs	11
Barges	10	Barges	26
Tonnage (about)	12,325	Tonnage (about)	41,335
		Schooners	2

FEBRUARY 16, 1917.

Barge Easton, L. Coal & Nav. Co..... 1,200
Barge Lansford, L. Coal & Nav. Co..... 1,200
Barge Greenwood, L. Coal & Nav. Co..... 1,500
Schooner Catawamteck..... 148
Schooner J. Howell Leeds..... 414
Schooner Flora M (about)..... 200
Tug Wm. H. Yerkes, towing 2 barges (about)..... 2,400
Tug Dauntless, towing 2 barges (about)..... 2,400
Tug Hugh Ross, towing 1 barge (about)..... 1,200
10,662

Nobska, weather B., W. 3 miles:
Steamed, tug Tamaqua, barges Bast, Eagle Hill, and Franklin. (This is the Reading tow that left Philadelphia for comparison with tug Conestoga.)

Passed Pollock Rip:
Tug Georges Creek—
Barge No. 14, Consolidated Coal Co. 1,600
Barge No. 15 1,600
Barge No. 19 1,600
Vineyard Haven, weather B., light, variable wind:
Arrived—
Schooner Wm. Bisbee 309
Schooner Edward H. Cole 1,791
Arrived and steamed tug Ramos—
Barge Glooscap (about) 1,200
Barge Plymouth 1,200
Steamed—
Tug M. Moran—
Barge Occidental, Seaboard T. Co. 2,450
Barge Crane, N. E. Coal & C. Co. 1,500
Tug Boswell—
Barge Edith, N. E. Coal & C. Co. 1,500
Barge Harvard, N. E. Coal & C. Co. 2,100

16,850

In canal:		Around cape:	
Tugs	3	Tugs	4
Barges	8	Barges	9
Schooners	3	Schooners	2
Tonnage (about)	10,662	Tonnage (about)	16,850

FEBRUARY 17, 1917.

Westbound—
Tug Cheektowaga, towing 3 barges, Lehigh Valley R. R. 3,600
Tug A. J. Stone, towing 3 barges, Erie R. R. 3,200
Tug Billow, towing 1 barge 1,000
Barge Wilmington 1,000
Barge Coaldale, L. Coal & N. Co 1,200
Barge Upton, Sus. Coal Co 1,000
Barge Ida Woods, Hughes 500

11,500

Arrived Boston, tug Tamaqua, towing barges Bast, Eagle Hill, and Franklin. (This is the Reading tow which went around cape in test with tug Conestoga.)
Passed Chatham, wind NE., light, M.:
Tug Nottingham—
Barge No. 9, L. Coal & Nav. Co. 1,100
Barge No. 14, L. Coal & Nav. Co. 1,500
Barge No. 15, L. Coal & Nav. Co. 1,500
Nobska, wind W., light, smoky:
Passed, tug Germantown—
Barge Exeter, Reading 3,000
Barge Logan, Reading 1,550
Barge Pennypack, Reading 1,175
Arrived, schooner Margaret Thomas 1,427
Vineyard Haven, wind W., light, M.:
Arrived, tug Catawissa—
Barge Oley, Reading 3,000
Barge Moselem, Reading 1,550
Barge Macungie, Reading 1,550
Sailed, schooner Edward H. Cole 1,791

In canal:		Around cape:	
Tugs	3	Tugs	3
Barges	11	Barges	9
Tonnage (about)	11,500	Schooners	2
		Tonnage (about)	19,143

FEBRUARY 18.

Tug Charles T. Gallegher:	
Barge Georgia, P. Dougherty	2,532
Barge Endicott, P. Dougherty	1,200
	3,732
Passed Chatham, wind SE., fresh, F. and R.:	
Tug Lykens—	
Barge Bear Ridge, Reading	1,550
Barge Suffolk, Reading	1,450
Barge Glendower, Reading	1,450
Passed Nobska:	
Tug Tamaqua—	
Barge Kohinoor, Reading	1,250
Barge Monitor, Reading	1,550
Barge Silver Brook, Reading	1,550
Vineyard Haven, wind S.; moderate; F. and R.:	
Arrived—	
Schooner Stanley M. Seaman	1,060
Schooner William Bisbee	309
Tug Lenape—	
Barge Cleona, Reading	1,550
Barge Beeckwood, Reading	1,250
Barge Indian Ridge, Reading	1,550

In canal:		Around cape:	
Tug	1	Tugs	3
Barges	2	Barges	9
Tonnage	3,732	Schooners	2
		Tonnage	14,519

FEBRUARY 20, 1917.

Passed west:	
Tug M. Moran, towing 2 barges, Moran Co., (about)	2,000
Tug Petrel, towing 3 barges, Moran Co. (about)	3,000
Arrived, tug Chandler, towing 1 barge (about)	1,000
	6,000
Vineyard Haven, wind variable S.:	
Arrived—	
Tug Chas. P. Greenough—	
Barge Lynn, Shawmut S. S. Co	2,650
Barge Portsmouth, Shawmut S. S. Co	2,650
Tug Mars—	
Barge Hampshire, F. W. Munn, Philadelphia	1,475
Barge Reading, F. W. Munn, Philadelphia	2,100
Tug International—	
Barge Tamanend, Reading	1,175
Barge Lincoln, Reading	1,450
Barge Langhorne, Reading	1,550
	13,050

In canal:		Around cape:	
Tugs	3	Tugs	3
Barges	6	Barges	7
Tonnage (about)	6,000	Tonnage (about)	13,050

FEBRUARY 22, 1917.

Schooner St. Bernard	400
Schooner Maud H. Dudley	392
Schooner Chas. L. Jeffreys	348
Tug Alert, barge Rahn, L. Coal & Nav. Co	1,600
Tug May:	
Towing 2 barges	2,000
Towing Chemango, C. W. Chadwick & Co	1,020
Towing Chemung, C. W. Chadwick & Co	1,020
	6,780

Vineyard Haven, wind SW., strong, B.:
Arrived—
Tug Plymouth—
Barge No. 10, L. & W. Coal Co..... 1,500
Barge No. 11, L. & W. Coal Co..... 1,500
Barge No. 12, L. & W. Coal Co..... 1,500
Tug Perth Amboy—
Barge No. 781, Lehigh Valley R. R..... 931
Barge No. 767, Lehigh Valley R. R..... 910
Barge No. 786, Lehigh Valley R. R..... 1,125
Steamed—
Tug Gypsum King, towing 3 barges, J. B. King Co..... 3,000
Tug Lenape—
Barge Cleona, Reading R. R..... 1,550
Barge Beechwood, Reading R. R..... 841
Barge Indian Ridge, Reading R. R..... 910
Tug International—
Barge Tamanend, Reading R. R..... 1,175
Barge Lincoln, Reading R. R..... 1,450
Barge Langhorne, Reading R. R..... 1,550
Tug Catawissa—
Barge Oley, Reading R. R..... 3,000
Barge Moselem, Reading R. R..... 1,550
Barge Macungie, Reading R. R..... 1,550
Tug Danl. Willard—
Barge Coastwise, So. Trans. Co..... 1,000
Barge Seneca, So. Trans. Co..... 700
Tug Bristol, barge Merriam, Reading R. R..... 1,450

In canal:		Around cape:	
Tugs	2	Tugs	8
Barges	5	Barges	21
Schooners	3	Tonnage	27,192
Tonnage (about)	6,780		

FEBRUARY 23, 1917.

Tug W. H. Yerkes, jr.:
Barge Greenwood, L. C. & Nav. Co..... 1,500
Barge Nesquehoning, L. C. & Nav. Co..... 1,500
Tug Narragansett, towing 2 lighters, Staples Trans. Co..... 600
Tug Albert J. Stone, towing 3 barges, Erie..... 3,000
6,600

Schooner Susie H. Davidson.
Vineyard Haven:
Tug Paoli—
Barge Montauk, Susquehanna Coal Co..... 1,000
Barge Waverly, C. W. Chadwick..... 1,000
Barge Avondale, C. W. Chadwick..... 2,020
Tug Carlisle, towing 3 barges, Reading..... 4,500
8,520

In canal:		Around cape:	
Tugs	3	Tugs	2
Barges	5	Barges	6
Lighters	2	Tonnage	8,520
Schooners	1		
Tonnage	6,600		

FEBRUARY 24, 1917.

Tug Waltham..... 353
Tug Mercury..... 150
Schooner R. Bowers..... 435
Schooner Mary A. Hall..... 381
Schooner Colin C. Baker..... 410
Barge Rahn, L. C. & Nav. Co..... 1,600
3,329

Nobska:
Anchored, tug Lenape—
Barge Hammond, Reading..... 1,025
Barge Brookside, Reading..... 1,250
Barge Logan, Reading..... 1,550
Vineyard Haven:
Arrived, tug Tamaqua, towing 3 barges, Reading (about)..... 3,500

7,325

In canal:		Around cape:	
Tugs	2	Tugs	2
Barges	1	Barges	6
Schooners	3	Tonnage	7,325
Tonnage	3,329		

FEBRUARY 25, 1917.

Tug Mercury:
Highland Light, 5 p. m.; wind SSE., 35 miles; dense F.
Chatham, 5 p. m.; wind E.; fresh; dense F.
Vineyard Haven, wind E.; fresh; dense F.

FEBRUARY 27, 1917.

U. S. S. Dupont..... 165
Schooner Warren B. Porter..... 368
Schooner Nettie Shipman..... 338
Schooner John Bracewell..... 224
Schooner Elma (Br.)..... 299
Schooner Rebecca C. Whillden..... 220
Tug May, barge S. T. No. 4..... 1,000

2,614

In canal:
U. S. torpedo boat..... 1
Schooners..... 5
Tug..... 1
Barge..... 1
Tonnage..... 2,614

EXHIBIT L.

DAILY REPORTS OF TRAFFIC OF COMMERCIAL VESSELS THROUGH CAPE COD CANAL AND AROUND CAPE COD FOR MONTHS OF MAY, JUNE, AND JULY, 1916.

[Reports copied from American shipping, New York Herald.]

Daily reports contained in this file are for 96 days from April 20, 1916, to August 13, 1916. Saturday's reports not shown and other dates missing, but the reports shown equal three months.

The steamer William Chisholm sunk in the canal on July 16, 1916, and the daily reports following that date show a decrease in the traffic through the canal.

RECAPITULATION.

	Vessels through Cape Cod Canal.	Vessels around Cape Cod.
Steamers	146	776
Scows	12	.....
Yachts	22	.....
Dredges	6	.....
Tugs	210	727
Barges	415	2,178
Schooners	248	271
Government vessels	14	.....
Lighters	59	.....
Motor vessels	9	1
Yawl	1	.....
Colliers	.....	1
Pontoons	27	.....
Total	1,169	3,954
Estimated gross tonnage	995,363	4,106,290

Gross tonnage of tugs towing vessels not shown.

CAPE COD CANAL.

APRIL 20, 1916.

Passed east:
- Tug Neponset, barge Rose Feney 1,000
- Lighthouse tender Azalea (fall trip), L. H. Dept 500

Passed west:
- Tug Tamaqua, towing 3 barges, Reading 2,400
- Motor barge S. T. Co. No. 62, Standard Trans. Co 700
- Schooner Annie Gus 99
- Schooner Lizzie J. Call 206
- Schooner Emma W. Day 96

Steamed from Sandwich: Tugs Jos. O'Riorden and Pallas, towing dredge Warfield for Boston.

Arrived Wings Neck, tug Narragansett:
- Barge Sharon, Staples 825
- Barge Coaldale, L. C. Nav. Co 1,200
- Barge Rahn, L. C. Nav. Co 1,600
- Barge Easton, Staples 900
- Barge Greenwood, L. C. Nav. Co 1,500

11,026

Highland Light, weather 5 p. m., SW., 20 miles, clear, smooth sea.

Chatham, weather 5 p. m., S., fresh breeze, cloudy.

Vineyard Haven, weather a. m., calm; p. m., SW.: light, clear, smooth sea.
- Sailed eastbound, schooner Kenneth C. (Br.) 551
- Steamed westbound, tug Thos. Scully, towing 2 barges, Luckenbach S. S. Co 2,000
- Passed westbound, tug Catawissa—
  - Barge Cacoosing, Reading 721
  - Barge Bast, Reading 693
  - Barge Cleona, Reading 956

3,121

In canal:		Around cape:	
Tugs	3	Tugs	2
Barges	9	Barges	5
Schooners	3	Schooners	1
Motor barge	1	Tonnage, estimated	3,121
Lighthouse tender	1		
Tonnage, estimated	11,026		

APRIL 21, 1916.

Passed west:
- Schooner Edith McIntyre 27
- Schooner Sarah A. Reed 158
- Schooner Willis & Guy 199
- Schooner Sarah & Lucy 252
- Schooner Roger Drury 360
- Schooner Emily F. Northam 332
- Tug Bristol 257

Passed east:
- Yacht Santanta 103
- Schooner Centennial 115

1,803

Highland Light, weather NE., 7 miles; raining; smooth sea:
- Passed west, tug Georges Creek—
  - Barge 5, Consol. Coal Co 909
  - Barge 23, Consol. Coal Co 1,035
  - Barge 27, Consol. Coal Co 1,290
- Passed east, tug Gettysburg—
  - Barge Bear Ridge, Reading 1,550
  - Barge Macungie, Reading 1,550
  - Barge Pickering, Reading 1,775

Chatham, weather N.; moderate, cloudy:
Passed east—
Tug Savage—
Barge 15, Consol. Coal Co..... 1,600
Barge 25, Consol. Coal Co..... 2,800
Tug Scranton—
Barge Avondale, Chadwick..... 2,020
Barge Waverly, Chadwick..... 1,800
Barge Musconetcong, Chadwick..... 1,375
Nobska, weather 3 p. m., ENE; 3 miles; cloudy:
Passed east—
Tug Conestoga—
Barge Paxinos..... 1,550
Barge Silver Brook..... 1,550
Barge Tohickon..... 1,175
21,379
Tug Sea King—
Barge Helen, N. E. Coal & Coke Co..... 2,400
Barge Irene, N. E. Coal & Coke Co..... 2,200
Barge Edith, N. E. Coal & Coke Co..... 1,500
Tug Concord—
Barge Cardenas, Staples..... 2,900
Barge Chatham, Staples..... 3,350
Passed west:
Tug Mars—
Barge Tabor, Reading..... 963
Barge Manatawney, Reading..... 721
Tug Honeybrook—
Barge L. & W. C. Co. 4, L. & W. Coal Co..... 700
Barge L. & W. C. Co. 10, L. & W. Coal Co..... 900
Barge L. & W. C. Co. 14, L. & W. Coal Co..... 900
Tug Swatara—
Barge Neshaminy, Reading..... 721
Barge Paxtang, Reading..... 954
Barge Hammond, Reading..... 693
Vineyard Haven:
Arrived and sailed, schooner Myrtle Leaf (Br.)..... 401
Passed west, schooner Hattie H. Barbour..... 301
40,983

In canal:		Around cape:	
Tugs	1	Tugs	10
Schooners	7	Barges	27
Motor boats	1	Schooners	2
Tonnage, estimated	1,803	Tonnage, estimated	40,983

APRIL 23, 1916.

No report.
Vineyard Haven, weather W.; moderate; smooth sea; foggy:
Arrived and sailed—
Schooner Wm. D. Marvel..... 454
Schooner Sam'l B. Hubbard..... 403
Schooner Nellie Eaton..... 118
975
Around cape:
Schooners..... 3
Tonnage..... 975

APRIL 24, 1916.

Passed east, Tug Petrel, towing 3 barges, Erie (tied up at Sandwich)..... 3,000
Highland Light, weather ENE.; 25 miles; thick fog; raining; rough sea.
Chatham, weather NE.; light breeze; thick fog.
Nobska, weather NE.; 14 miles; misty:
Passed east, steamer Bay Port, White Oak Trans. Co..... 1,800
Anchored, schooner Barbara..... 838

Vineyard Haven:
Arrived eastbound—
Schooner M. A. Belliveau (Br.) 200
Schooner Eliza A. Scribner 200
Tug Cheektowaga, towing 3 barges, Lehigh Valley 3,000
Tug Western, towing 3 barges, N. Y., O. & W. R. R 3,000
Tug Richard Young, towing 3 barges 3,000
Passed eastbound—
Tug Lenape—
Barge Molino, Reading 1,550
Barge Maple Hill, Reading 1,550
Steamed eastbound, tug Standard Barge No. 3, Standard T. Co 1,000
Sailed westbound—
Schooner Harry W. Lewis (Br.) 305
Schooner Nellie Eaton 118

16,561

In canal:		Around cape:	
Tugs	1	Tugs	5
Barges	5	Barges	12
Tonnage, estimated	3,000	Schooners	4
		Steamers	1
		Tonnage, estimated	16,561

APRIL 25, 1916.

Sailed from Sandwich, schooner T. W. Allan 113
Passed west, tug Nellie 50
Arrived Wings Light, tug Watuppa:
Barge Lansford, L. C. & N. Co 1,200
Barge Panther Creek, L. C. & N. Co 1,000
Returned west, tug Watuppa, towing barge Allentown, L. C. & N. Co 842

3,205

Highland Light, weather 5 p. m. SW. 12 miles; partly cloudy; smooth sea:
Passed west, tug Thos. J. Scully, barge J. B. Walker, Luckenbach 3,000
Tug Lehigh—
Barge 740, Lehigh Valley 1,210
Barge 765, Lehigh Valley 910
Barge 781, Lehigh Valley 1,625
Tug left Boston for Plymouth to pick up barge 781 and then proceeded around cape.
Passed west, tug Wyoming—
Barge 766, Lehigh Valley 910
Barge 767, Lehigh Valley 910
Barge 792, Lehigh Valley 850
Passed east, tug Germantown—
Barge Phoenix, Reading R. R 1,550
Barge Oley, eading R. R 3,000
Barge Saucon, Reading R. R 1,550
Passed west, tug Fred E. Richards—
Barge R. & R. L. Co. No. 1, Chadwick 1,000
Barge R. & R. L. Co. No. 3, Chadwick 1,000
Barge Glooscap, Chadwick 800
Chatham, weather 5 p. m., SE.; moderate breeze; fog shutting in:
Passed west, tug Monocacy—
Barge Brookside, Reading . R 841
Barge Lincoln, Reading R. R 855
Barge Tamanend, Reading R. R 721
Passed east—
Tug Cuba, Staples Trans 594
Tug Catawissa, towing 3 barges, Reading R. R 4,000
Nobska, weather SW., light; fair.
Passed west, tug Gypsum King, towing 3 barges, J. B. King Co 3,000
Vineyard Haven, weather E., moderate; clear; p. m., cloudy:
Arrived—
Schooner Alberta (Br.) 200
Schooner Wanola (Br.) 314

Vineyard Haven—Continued.
Arrived westbound—
Tug Gwalia, towing 2 barges, N. E. C. & C. Co..... 2,000
Tug Chas. W. Parker, jr., towing 1 barge, Com. T. B. Co..... 800
Steamed eastbound—
Tug Perth Amboy, towing 3 barges, Lehigh Valley..... 3,000
Tug M. Moran, towing 2 barges, Moran Trans..... 1,600
Passed eastbound, tug Prudence, barge Harrisburg, F. W. Munn..... 2,100

38,340

In canal:		Around cape:	
Schooners	1	Schooners	2
Tugs	2	Tugs	14
Estimated tonnage	3,205	Estimated tonnage	38,340
Barges	3	Barges	31

APRIL 26, 1916.

Passed east, tug T. Coney:
Barge Chemung, Chadwick..... 671
Barge Cohocton, Chadwick..... 671
Passed east, motor barge No. 62, Standard T. Co..... 1,500
Arrived Wings Neck, tug Cora L. Staples, towing 3 barges, Staples T. Co.. 3,000
Barges towed to Sandwich, tug returned light..... 300
Passed west, schooner Rebecca M. Walls..... 590

6,732

Highland Light, weather 5 p. m. NE.; 25 miles; thick fog; rain:
Passed west, tug Standard Barge No. 5, Standard T. Co..... 800
Chatham, weather 5 p. m. NE.; fresh breeze; thick fog:
Passed west, tug Lenape—
Barge Conewago, Reading R. R..... 956
Barge Ontelaunce, Reading R. R..... 739
Barge Thomaston, Reading R. R..... 693
Nobska, weather 4.30 p. m. NE.; 12 miles; cloudy:
Passed west—
Tug Sea King—
Barge Biwabek, N. E. C. & Coke Co..... 800
Barge Helen, N. E. C. & Coke Co..... 800
Tug Cumberland—
Barge No. 17, Consolidation C. Co..... 935
Barge No. 18, Consolidation C. Co..... 936
Barge No. 10, Consolidation C. Co..... 897
Passed east, tug Valley Forge—
Barge Marion, Reading R. R..... 1,550
Barge Cocalico, Reading R. R..... 1,550
One other, Reading R. R..... 1,500
Passed west, tug Concord, barge Cardenas, Chatham, Tipton, Staples... 4,218
Vineyard Haven:
Passed west—
Schooner Gladys B. Smith (Br.)..... 300
Tug Scranton—
Barge Chenango, Chadwick..... 700
Barge Nay Aug, Chadwick..... 800
Barge Plymouth, Chadwick..... 700

18,874

In canal:		Around cape:	
Tugs	3	Tugs	7
Barges	5	Barges	18
Schooners	1	Schooners	1
Motor barge	1	Tonnage, estimated	18,874
Tonnage, estimated	6,732		

STEAMERS AROUND CAPE.

Passed Nobska:	
Westbound—	
Steamer Tuscan, Mer. & Miners T. Co	2,415
Steamer Chr. Bors (Dan.).	
Eastbound, steamer Onondaga, Clyde Line	2,696
Westbound—	
Steamer Turret Crown (Br.)	1,827
Steamer Bay View, White Oak Trans. Co	1,399
Arrived Boston:	
Steamer Nacoochee, from Savannah, Ocean S. S. Co	2,680
Steamer Dorchester, from Baltimore, Mer. & Miners T. Co	2,537
H. F. Dimock, from New York, Eastern S. S. Corpn	2,625
Steamer New Orleans, from Tampa, Boca Grande S. S. Co	1,564
Steamed from Boston:	
Steamer Dania (Dan.), for New York	3,898
Steamer Glenellah (Br.), for New York	2,272
Steamer Queen Elizabeth (Br.), for New York	1,784
Steamer Dromore (Br.), for Philadelphia	2,000
Steamer Howard, for Newport News, Mer. & Miners T. Co	3,581
Steamer J. S. Whitney, for New York, Eastern S. S. Corpn	2,707
Steamer Tomsk (Dan.)	1,500
	35,485
American vessels	9
Foreign vessels	7
Tonnage estimated	35,485

APRIL 27, 1916.

Passed west, tug Petrel, towing 3 barges, Erie R. R	2,400
Passed east, tug Ed. Haley, barge Ruth, Chadwick	1,000
	3,400
Arrived Boston:	
Steamer Nantucket, from Norfolk, Merchants & Miners	2,599
Steamer J. H. Devereaux, from Philadelphia	1,618
Steamer Ravenscraig, from Norfolk, Eastern Coal Co.	
Tug Lykens—	
Barge Franklin, P. & R. R. R	1,550
Barge Merriam, P. & R. R. R	1,450
Barge Indian Ridge, P. & R. R. R	1,550
Tug Security—	
Barge S. T. Co. 86, Standard T. Co	1,000
Barge S. T. Co. 123, Standard T. Co	1,000
Steamed from Boston:	
Steamer Parthian, for Philadelphia, Merchants & Miners	2,082
Steamer San Marcos, for New York, Mallory S. S. Co	2,839
Steamer Montana, for Newport News, Pacific Coast Co	2,562
Steamer Bay State, for Sewells Point, White Oak Trans. Co	1,245
Highland Light, weather, 5 p. m., NE., 8 miles, partly cloudy.	
Passed, steamer William Chisholm, for Portland, Seaboard Trans. Co	1,581
Passed west—	
Tug Nottingham—	
Barge L. & W. C. Co. 9, L. & W. C. Co	700
Barge L. & W. C. Co. 5, L. & W. C. Co	700
Barge Wilkesbarre	1,300
Tug International—	
Barge Buck Ridge, P. & R. R. R	915
Barge Mahonoy, P. & R. R. R	855
Barge Glendower, P. & R. R. R	855
Chatham, weather, NE., light breeze, cloudy:	
Passed west, S. S. Meteor, Pacific Coast Co	2 301

Nobska, weather, NE., 10 miles, cloudy:
Passed tug Mercury, towing—
Schooner Margaret..... 117
Barge Shickshinny, Chadwick..... 800
Vineyard Haven, weather, E., moderate, cloudy, smooth sea:
Arrived westbound, schooner Beatrice L. Corkum (Br.)..... 97
Steamed eastbound—
Tug Honeybrook, towing 3 barges, L. & W. C. Co..... 3,000
Tug Tamaqua—
Barge Draper, P. & R. R. R..... 1,450
Barge Monitor, P. & R. R. R..... 1,550
Barge Henry Clay, P. & R. R. R..... 1,150
Tug Mars—
Barge Reading, F. W. Munn..... 2,100
Barge Eagle Hill, Reading..... 1,550
Arrived, schooner Chas. L. Jeffrey..... 348
Steamed eastbound, steamer Freshfield (Br.).

40,864

In canal:		Around capes:	
Tugs	2	Tugs	8
Barges	4	Barges	20
Tonnage, estimated	3,400	Schooners	2
		Steamers	10
		Tonnage, estimated	40,864

APRIL 28, 1916.

Passed west:
Tug Edgar F. Coney—
Barge Avondale, Chadwick..... 1,111
Barge R. & R. Co. No. 6, Chadwick..... 800
Schooner Nettie Shipman..... 338

2,249

BOSTON.

Arrived:
Steamer City of Atlanta from Savannah, Ocean S. S. Co..... 5,433
Steamer Indian, from Philadelphia, M. & M. T. Co..... 2,110
Steamer Kershaw, from Baltimore, M. & M. T. Co..... 2,599
Steamer H. M. Whitney, from New York, East. S. S. Corpn..... 2,706
Steamed:
Steamer Norfolk, for Baltimore, Coast S. S. Co..... 3,521
Steamer Everett, for Lamberts Point, N. E. C. & Coke Co..... 5,103
Steamer Melrose, for Newport News. N. E. C. & Coke Co..... 5,107
Highland Light, weather 5 p. m. NE.; 25 miles; thick, rainy, rough.
Chatham, weather 5 p. m. NE.; light breeze; thick fog.
Nobska, weather 5 p. m. N.; 15 miles; fog and rain.
Vineyard Haven, weather N.; fresh, thick, rainy; choppy sea.
Arrived, westbound, schooner Ralph M. Hayward..... 604
Passed, westbound, tug Savage—
Barge No. 20, Con. Coal Co..... 940
Barge No. 25, Con. Coal Co..... 1,566

29,689

In canal:		Around cape:	
Tugs	1	Tugs	1
Barges	2	Barges	2
Schooners	1	Schooners	1
Tonnage, estimated	2,249	Steamers	7
		Tonnage, estimated	29,689

APRIL 30, 1916.

Passed west:
Tug Juno, towing 1 barge..... 800
Motor barge No. 62, Standard T. Co..... 800
Steam lighter Cornelias..... 285

Passed east:
- Tug Mexpet, towing—
  - Derrick lighter, Atlantic, Gulf & Pacific Co. 250
  - 27 pontoons, Atlantic, Gulf & Pacific Co. 2,700
  - Barge, Atlantic, Gulf & Pacific Co. 70
- Tug Narragansett, towing—
  - Schooner Grace D Chambers 379
  - 1 barge 800

Arrived, Sandwich, tug Francis C. Hersey 79

6,163

BOSTON.

Arrived:
- Steamer St. Dunstan (Br.) from Hampton Roads 2,966
- Steamer Gloucester, from Norfolk, Merchants & Miners 2,541
- Steamer Brandon, from Baltimore 2,431
- Steamer Tuscan, from Philadelphia, Merchants & Miners 2,415

Steamed:
- Steamer Onondaga, for Charleston, Clyde Line 2,696
- Steamer J. H. Devereaux, for Norfolk 1,618
- Steamer Arlington, for Baltimore 1,446
- Steamer Bratsberg (Nor.), for New York 3,856
- Steamer Welsh Prince (Br.), for New York 4,934

Vineyard Haven; weather W.; moderate; clear; smooth sea:

Passed—
- Steamer City of Augusta, Clyde Line 2,869
- Tug Walter A. Luckenbach—
  - Barge City of Washington 2,410
  - Barge Annie H. Smith 1,487
- Tug Fred. E. Richards, towing 3 barges 3,000
- Tug M. E. Luckenbach, towing 3 barges 3,000

37,669

In canal:		Around cape:	
Tugs	4	Tugs	3
Barges	2	Barges	7
Motor barge	1	Steamers	9
Steam lighter	1	Tonnage, estimated	37,669
Derrick barge	2		
Pontoons	27		
Schooners	1		
Tonnage, estimated	6,163		

MAY 1, 1916.

Passed east:
- Tug May, towing 2 barges, Chas. Gring, Philadelphia 2,000
- Schooner Eva A. Danenhower 228
- Schooner Vineyard 215

Passed west:
- Tug Hugh Ross, towing 3 barges, Chadwick Co. 2,400
- Tug Augustus, towing—
  - Dredge No. 5 250
  - Barge 100
- Tug Mexpet 250
- Tug Francis C. Hersey, towing 2 scows 400
- Tug Narragansett, towing 2 barges 1,400

7,243

BOSTON.

Arrived:
- Steamer Ontario, from Baltimore, Mer. & Min. T. Co. 3,099
- Steamer Norfolk, from Norfolk, Coastwise S. S. Co. 3,521
- Tug Edgar F. Luckenbach—
  - Barge West Point, Luckenbach S. S. Co. 2,000
  - Barge Josephus, Luckenbach S. S. Co. 2,000
- Tug Standard, barge No. 5, Standard T. Co. 1,000

Highland Light; weather S. W. 30 miles; cloudy; smooth sea:
- Passed, tug Security, barges S. T. Co.—
  - No. 86, Standard T. Co. 1,000
  - No. 123, Standard T. Co. 1,000

Chatham; weather 5 p. m., S. W.; moderate breeze; clear:
- Passed, eastbound—
  - Tug Tacony, towing 3 barges, Sus. Coal Co. 3,000
  - Tug Catawissa—
    - Barge Oak Hill, Reading R R. 1,550
    - Barge Temple, Reading R. R. 1,550
    - Barge Spring, Reading R. R. 3,000
  - Tug Gettysburg—
    - Barge Cumru, Reading R. R. 3,000
    - Barge Ephrata, Reading R. R. 1,550
    - Barge Tabor, Reading R. R. 1,550
- Passed, westbound, tug Tamaqua—
  - Barge Oley, Reading R. R. 1,780
  - Barge Richardson, Reading R. R. 693
  - Barge Tohickon, Reading R. R. 739

Passed eastbound, tug Chas. P. Greenough:
- Barge Hattie, N. E. C. & Coke Co. 1,800
- Barge Nanticoke, N. E. C. & Coke Co. 1,900

Nobska, weather SW.; 10 miles; light breeze; clear:
- Passed westbound—
  - Tug Mars—
    - Barge Larimer, F. W. Munn, Philadelphia 800
    - Barge Maple Hill, F. W. Munn, Philadelphia 911
  - Steamer Bay View, White Oak T. Co. 1,399
  - Schooner Horace A. Stone 1,376
- Passed eastbound, tug Murrell—
  - Barge Iron Queen, N. E. C. & Coke Co. 1,200
  - Barge Grace, N. E. C. & Coke Co. 1,500
  - Barge Beattie, N. E. C. & Coke Co. 2,200
- Passed westbound, tug Conestoga, towing 3 barges, Reading R. R. 2,400

Vineyard Haven, weather SW.; moderate breeze; clear; smooth sea:
- Sailed eastbound—
  - Schooner Florence M. Belding 569
  - Schooner James Slater 311
- Steamed—
  - Tug Boswell, towing 2 barges, N. E. C. & Coke Co. 3,000
  - Tug Piedmont, towing 3 barges, Consolidation C. Co. 4,500
- Sailed, schooner Leora M. Thurlow 213

56,111

In canal:		Around cape:	
Tugs	6	Tugs	13
Barges	8	Barges	32
Scows	2	Steamers	3
Dredge	1	Schooners	4
Schooners	2	Tonnage, estimated	56,111
Tonnage, estimated	7,243		

MAY 2, 1916.

Passed east:
- Lighter Cornelia 200
- Tug Petrel—
  - Barge Rondout, Erie 1,500
  - Barge Scranton, Erie 750
  - Barge Albany, Erie 1,120
- Tug Jno. G. Chandler, barge Caddo 1,000

Passed west:
- Steamer Mohawk, Maine Coast S. S. Co. 535
- Schooner Nellie Grant 139
- Schooner Daniel McLoud 295
- Schooner Nat. Meader 278
- Schooner Abbie S. Walker 190
- Schooner Jennie A. Stubbs 198

Passed west—Continued.
Schooner Sallie E. Ludlam 237
Schooner Sarah L. Davis 180
Schooner Alice S. Wentworth 68
Schooner Odell 141
Yacht Kestrel II 99

6,930

BOSTON.

Arrived:
Steamer Dorchester from Norfolk, Merchants & Miners 2,537
Schooner Margaret Thomas from Jacksonville 1,427
Steamer Bay State from Newport News, White Oak T. Co 1,245
Steamer Montara from Sewells Point, Pacific Coast S. S. Co 2,562
Steamed:
Steamer Tuscan for Philadelphia, Merchants & Miners 2,415
Steamer Malden for Baltimore, New Eng. Coal & Coke 5,107
Steamer City of Augusta for Savannah, Ocean S. S. Co 2,869
Steamer Black Rock for Norfolk 1,997
Steamer Jas. S. Whitney for New York, Eastern S. S. Co 2,707
Tug W. A. Luckenbach—
Barge Senaca, Luckenbach S. S. Co 2,208
Barge Solitaire 1,515
Highland Light, weather 5 p. m. NW.; 10 miles; clear; smooth sea:
Passed westbound—
Tug Edgar F. Luckenbach, barge Gen. Knox, Luckenbach S. S. Co. 1,587
Tug Perth Amboy—
Barge No. 782, Lehigh Valley 924
Barge No. 783, Lehigh Valley 923
Barge No. 784, Lehigh Valley 919
Chatham, weather 5 p. m. S.; moderate breeze; foggy.
Vineyard Haven:
Arrived—
Eastbound, schooner Rhoda Holmes 375
Westbound, schooner Cora M. (Br.) 144
Eastbound, tug Ontario, towing 3 barges, N. Y., O. & W. R. R. 3,000

34,461

In canal:		Around cape:	
Lighters	1	Barges	9
Barges	4	Tugs	4
Tugs	2	Schooners	3
Steamers	1	Steamers	8
Schooners	9	Tonnage, estimated	34,461
Yachts	1		
Tonnage, estimated	6,930		

MAY 3, 1916.

Passed west:
Schooner James H. Hoyt 414
Schooner Addie P. McFadden 251
Tug Neponset, barge Rahn 932

1,597

BOSTON.

Arrived:
Steamer Howard, from Baltimore, Merchants & Miners 3,581
Steamer Parthian, from Philadelphia, Merchants & Miners 2,082
Steamer H. M. Whitney, New York, Eastern S. S. Co 2,706
Steamed:
Steamer Aros Castle (Br.), for New York 4,459
Steamer Dorchester, for Baltimore, Merchants & Miners 2,537

15,365

Highland Light, weather SE.; 18 miles; cloudy:
Passed westbound—
Steamer C. A. Jacques (Br.) 2,105
Steamer Themis (Nor.) .....
Steamer H. F. Dimock, Eastern S. S. Corp 2,625
Tug Carlisle—
Barge Saucon, Reading R. R 955
Barge Franklin, Reading R. R 910
Barge Cocalico, Reading R. R 956
Tug Piedmont—
Barge 7, Consolidation Coal Co 898
Barge 24, Consolidation Coal Co 1,566
Steamer Northland 3,282
Tug Murrell—
Barge Ivin 900
Barge Tunkhannock 800
Chatham, weather SE.; moderate breeze; cloudy:
Passed eastbound, steamer Bay Port 1,399
Vineyard Haven, weather E.; moderate; clear; smooth sea:
Sailed westbound—
Schooner Ann J. Trainor 426
Schooner Alen M. Colburn 1,603
Schooner Winchester 303
Passed eastbound:
Tug Concorn, towing 2 barges, Staples Trans. Co 2,000
Tug Standard, barge No. 5, Standard T. Co 1,000
Tug Standard, barge No. 6, Standard T. Co 1,000
Sailed westbound, schooner Lavolta 204

38,297

In canal:		Around cape:	
Schooners	2	Schooners	4
Tugs	1	Tugs	5
Barges	1	Barges	11
Tonnage, estimated	1,597	Steamers	10
		Tonnage, estimated	38,297

MAY 4, 1916.

Passed west:
Tug Petrel, towing 3 barges, Erie R. R 2,400
Schooner Jessie Ashley (Br.) 143
Lighter Cornelia 200
Arrived Sandwich:
Tug Neponset, barge Rose M. Feeney, Jas. Hughes 700
Tug Wm. Yerkes, barges—
Panther Creek, Chadwick Co 700
Brunswick, Chadwick Co 700
Summitt Hill, Chadwick Co 700

5,543

BOSTON.

Arrived:
Steamer Kershaw, from Norfolk, Mer. & Miners 2,599
Steamer Nacoochee, from Savannah, Ocean S. S. Co 2,680
Steamer Katahdin, from Charleston, Clyde Line 2,696
Steamer J. H. Devereux, from Norfolk 1,618
Tug Internation—
Barge Suffolk, Reading 1,450
Barge Tamanend, Reading 1,175
Barge Brookside, Reading 1,250
Tug Cheektowaga—
Barge No. 781, Lehigh Valley 1,625
Barge No. 782, Lehigh Valley 1,625
Barge No. 783, Lehigh Valley 1,625
Tug Boswell—
Barge Annie, N. E. C. & C. Co 1,400
Barge Cassie, N. E. C. & C. Co 1,400

Arrived—Continued.
- Tug Paoli—
  - Barge Haverford, Sus. Coal Co 1,000
  - Barge Strafford 1,000
  - Barge Radnor 1,000

Steamed:
- Steamer Parthian, for Philadelphia, Mer. & Miners 2,082
- Steamer Howard, for Norfolk, Mer. & Miners 3,581
- Steamer Bay State, for Newport News, White Oak T. Co 1,245
- Tug Plymouth—
  - Barge L. & W. C. Co. 14, L. & W. C. Co 800
  - Barge L. & W. C. Co. 3, L. & W. C. Co 900
  - Barge L. & W. C. Co. 10, L. & W. C. Co 900
- Tug Tacony—
  - Barge Pequest, Chadwick 800
  - Barge Canisteo, Chadwick 700
  - Barge Upton, Chadwick 843
- Tug Wyoming—
  - Barge No. 700, Lehigh Valley 934
  - Barge No. 701, Lehigh Valley 934
  - Barge No. 704, Lehigh Valley 934

Highland Light; weather 5 p. m. S.; 7 miles; foggy; smooth sea:
- Passed, steamer Norfolk for Lamberts Point, Coastwise S. S. Co 3,521

Chatham:
- Passed westbound, tug Catawissa—
  - Barge Cacoosing, Reading 721
  - Barge Indian Ridge, Reading 910
  - Barge Merriam, Reading 855

Nobska; 4.25 p. m., weather, SW.; 5 miles; clear:
- Passed westbound—
  - Tug Lenape—
    - Barge Langhorne, Reading 955
    - Barge Neshaminy, Reading 721
    - Barge Robesonia, Reading 955
  - Tug Nottingham—
    - Barge No. 4, L. & W. Coal Co 800
    - Barge No. 11, L. & W. Coal Co 900
    - Barge No. 12, L. & W. Coal Co 900
  - Tug Gypsum King, towing 3 barges, J. B. King Co 3,000
- Passed eastbound, motor barge No. 62 800

Vineyard Haven; weather W.; variable; light; clear:
- Sailed eastbound, schooner Horace M. Bickford 503
- Sailed westbound, schooner Annie B. Mitchell 463
- Sailed eastbound, tug Mars, barge Penn, F. W. Munn 3,400

58,200

In canal:		Around cape:	
Tugs	3	Tugs	12
Schooners	1	Schooners	2
Lighters	1	Steamers	8
Barges	7	Barges	34
Tonnage estimated	5,543	Tonnage estimated	58,200

MAY 5, 1916.

Passed west:
- Schooner Telumah 230
- Tug John G. Chandler, barge Caddo, Texas Oil Co 800
- Tug Neponset—
  - Barge Greenwood Chadwick 900
  - Barge Hauto 830

Passed east:
- Schooner Emma W. Day 96
- Schooner Harriet C. Whitehead 222
- Tug Mexpet, towing dredge Pittsburg and plant 407
- Tug A. J. Stone, towing 3 barges 3,000

6,408

BOSTON.

Arrived:
- Steamer Romanby (British), from Norfolk 3,835
- Steamer Berkshire, from Norfolk, Merchants & M. 2,014
- Steamer Indian, from Philadelphia, Mer. & Miners 2,110
- Steamer Jas. S. Whitney, from New York, Eastern S/S 2,707

Steamed:
- Steamer Montara, for Sewalls Point, Pac. Coast S/S 2,562
- Steamer Kershaw, for Newport News, Mer. & Miners 2,599

Highland Light; weather 5 p. m., SE.; 5 miles; cloudy:
- Passed steamer North Land, Eastern S/S Co 3,159

Chatham; weather 5 p. m., NE.; moderate; cloudy:
- Passed tug Toledo, barge Detroit 900

Nobska; ESE.; 12 miles; raining:

Passed westbound:
- Tug Germantown—
  - Barge Leesport, Reading 963
  - Barge Moselem, Reading 963
  - Barge Richardson, Reading 693
- Steamer Bay View, White Oak T. Co 1,399
- Steamer Dorothy, A. H. Bull S. S. Co 2,214
- Steamer San Juan, Pac. Mail S. S. Co 2,152
- Tug Chas. P. Greenough—
  - Barge Emelie, N. E. C. & C. Co 1,069
  - Barge Grace 877
  - Barge Iron Queen 800

Passed eastbound, steamer Nantucket, Mer. & Miners 2,599

Vineyard Haven; weather, E.; moderate; thick and rainy:

Arrived eastbound—
- Schooner Anne P. Chase 256
- Tug Cumberland—
  - Barge No. 10, Con. Coal Co 1,500
  - Barge No. 17, Con. Coal Co 1,600
  - Barge No. 18, Con. Coal Co 1,600

38,571

In canal:		Around cape:	
Tugs	4	Steamers	11
Barges	6	Tugs	4
Schooners	3	Barges	10
Dredge and plant	1	Schooners	1
Tonnage estimated	6,478	Tonnage estimated	38,571

MAY 7, 1916.

No report.

BOSTON.

Arrived:
- Tug Walter A. Luckenbach from New York, Luck. S. S. Co 434
- Steamer Theseus (Br.) from Newport News 984
- Steamer Ontario from Norfolk, Mer. & Min. T. Co 3,099
- Steamer Tuscan from Philadelphia, Mer. & Min. T. Co 2,415

Steamed:
- Steamer Slingsby (Br.) for New York 3,231
- Steamer Arlington for Baltimore, N. E. C. & Coke Co 2,431
- Tug Walter A. Luckenbach—
  - Barge West Point, Luck S. S. Co 1,213
  - Barge W. F. Babcock 2,128
  - Barge C. F. Sargent 1,689

Vineyard Haven, weather, a. m. SW., moderate, clear; p. m. thick, rainy:
- Arrived, Schooner Sarah Eaton 199
- Passed—
  - Steamer J. H. Devereux for Norfolk 1,618
  - Steamer Millinocket for New York, A. H. Bull S. S. Co 3,336
- Passed eastbound—
  - Tug Gwalia, towing 3 barges, N. E. C. & Coke Co 3,000
  - Tug Georges Creek, towing 2 barges, Con. C. Co 2,000
  - Tug Standard, towing 1 barge, Stan. T. Co 1,000

Vineyard Haven—Continued.
Passed westbound—
Tug Ontario—
Barge Cadosia, N. Y. O. & W. R. R. Co..... 756
Barge Sidney, N. Y. O. & W. R. R. Co..... 745
Barge Forest Belle, N. Y. O. & W. R. R. Co..... 1,333
Tug Cheektowaga—
Barge No. 703, Lehigh V. R. R..... 1,620
Barge No. 705, Lehigh V. R. R..... 1,620
Barge No. 707, Lehigh V. R. R..... 1,620
Tug Boxer—
Barge Reading, F. W. Munn, Philadelphia..... 1,283
Barge Hampshire, F. W. Munn, Philadelphia..... 850
Barge Harrisburg, F. W. Munn, Philadelphia..... 1,200
Passed eastbound—
Tug Sea King—
Barge Biwabik, N. E. C. & Coke Co..... 1,000
Barge Helen, N. E. C. & Coke Co..... 1,285
Tug Lehigh, towing 3 barges, Lehigh V. R. R..... 3,000
Passed westbound, tug International—
Barge Enterprise, Reading..... 901
Barge Draper, Reading..... 855
Barge Eagle Hill, Reading..... 911

In canal:
No report.

Around cape:
Tugs..... 11
Barges..... 26
Steamers..... 7
Schooners..... 1
Tonnage, estimated..... 47,756

MAY 8, 1916.

Passed west:
Tug Mexpet, lighter Blanche..... 200
Tug Albert J. Stone, towing 3 barges, Erie..... 2,400
Tug Olympic, towing 2 scows..... 800
Passed east:
Lighter Cornelia..... 200
Tug Bristol, barge Foster..... 900
Passed west:
Tug Bristol, towing 3 barges..... 2,400
Tug E. D. Haley, barge Ruth..... 800
Passed east:
Tug E. D. Haley..... 200
Tug Hugh Ross—
Barge Chemung..... 800
Barge R. & R. Co. No. 1..... 800
Passed west:
Schooner Melissa Trask..... 236
Schooner Ravela (Br.)..... 200
Schooner Charles H. Trickey..... 281
Passed east, yacht Snapshot..... 13

10,230

BOSTON.

Arrived:
Steamer City of Atlanta from Savannah, Ocean S. S. Co..... 5,433
Steamer Lexington from Newport News, Mer. & Min. T. Co..... 2,092
Tug Prudence—
Barge H. A. Allyn, F. W. Munn..... 1,000
Barge Geo. R. Stetson, F. W. Munn..... 1,000
Barge Chas. F. Pritchard, F. W. Munn..... 1,000
Tug Perth Amboy—
Barge No. 780, Lehigh Valley..... 1,625
Barge No. 785, Lehigh Valley..... 1,125
Barge No. 795, Lehigh Valley..... 750

Arrived—Continued.
Tug M. E. Luckenbach—
Barge Washington, Luckenbach S. S. Co..... 1,724
Barge Carrie Clark, Luckenbach S. S. Co..... 1,298
Tug Richmond—
Barge Occidental, Seaboard T. Co..... 2,450
Barge Indiana, Seaboard T. Co..... 2,850
Steamed, steamer Berkshire for Baltimore, Mer. & Min. T. Co..... 2,014

Highland Light, weather 5 p. m. SW., 25 miles, thick fog.
Vineyard Haven, weather W., moderate, foggy:
Arrived eastbound:—
Schooner Wawenock..... 325
Schooner Clifford I. White..... 305
Tug Scranton—
Barge Hopatcong, Chadwick..... 1,375
Barge Nay Aug, Chadwick..... 1,375
Barge Pohatcony, Chadwick..... 1,375
Tug Thos. J. Scully, towing 1 barge, Luckenbach..... 1,000
Tug Walter A. Luckenbach, towing 3 barges, Luckenbach..... 3,000

In canal:		Around cape:	
Tugs	8	Tugs	7
Barges	10	Barges	17
Lighters	2	Steamers	14
Scows	2	Schooners	2
Schooners	3	Tonnage estimated	33,116
Yachts	1		
Tonnage estimated	10,230		

MAY 9, 1916.

Passed east:
Tug Petrel—
Barge Hawthorne, Erie R. R..... 1,140
Barge Hackensach, Erie R. R..... 1,550
Barge Binghamton, Erie R. R..... 900
Tug Albatross, barge Henry Endicott..... 1,200
Passed west, tug W. H. Yerkes, barge Easton, Chadwick..... 830
Passed east, tug W. H. Yerkes, barge K. Horan, Chadwick..... 1,000
Passed west:
Schooner Mary E. Olys..... 224
Sloop Escort..... 10
Sloop Annie Mack..... 10
Yacht Red Pepper..... 10
6,874

BOSTON.

Arrived:
Steamer Howard, from Norfolk, Mer. & Min. T. Co..... 3,581
Steamer Bay State, from Norfolk, White Oak T. Co..... 1,245
Tug M. Moran, barge San Joaquin, Luckenbach S. S. Co..... 1,551
Steamed:
Steamer Moldegaard (Nor.), for Delaware Breakwater..... 2,735
Steamer Tuscan, for Philadelphia, Mer. & Min. T. Co..... 2,415
Steamer New Orleans, for Norfolk, Boca Grande S. S. Co..... 1,564
Tug Concord—
Barge Tipton, Staples T. Co..... 830
Barge Chatham, Staples T. Co..... 1,812
Highland Light, weather, 5 p. m., NW., 20 miles, hazy, smooth sea:
Passed westbound, tug Cumberland—
Barge No. 14, Consolidated C. Co..... 927
Barge No. 21, Consolidated C. Co..... 905
Barge No. 23, Consolidated C. Co..... 1,035
Chatham, weather, 5 p. m., NW., fresh, clear:
Passed eastbound, tug Western—
Barge Ellenville, N. Y., O. & W. R. R..... 1,600
Barge Pilgrim, N. Y., O. & W. R. R..... 2,250
Barge Smyrna, N. Y., O. & W. R. R..... 1,275

Chatham—Continued.
Passed tug Lykens—
Barge Bast, Reading R. R. 693
Barge Pennypack, Reading R. R. 739
Barge Molino, Reading R. R. 954
Passed tug Tamaqua, towing 3 barges, Reading R. R. 2,500
Passed tug Conestoga, towing 3 barges, Reading R. R. 2,500
Passed, tug Savage, towing 3 barges, Consolidation C. Co. 2,500
Nobska, weather 5 p. m. NW., 8 miles, clear:
Passed eastbound, tug Patience—
Barge Rutherford, Reading R. R. 1,550
Barge Glendower, Reading R. R. 1,450
Vineyard Haven, May 9, weather W., fresh, clear, smooth sea:
Arrived eastbound—
Schooner Annie Gus 99
Schooner Maple Leaf (Br.) 251
Schooner Emma S. Briggs 294
Schooner Seth W. Smith 198
Schooner Kennebec 187
Schooner Ernst T. Lee 173
Schooner John A. Beckman 485
Schooner Percy C. (Br.) 200
Schooner Albertha (Br.) 200
Schooner Flo F. Mader (Br.) 116
Sailed, eastbound—
Schooner Leora M. Thurlow 213
Schooner Rebecca G. Whilldin 220
Passed, eastbound—
Tug Mercury—
Barge Shickshinney, Chadwick 1,350
Barge Cohocton, Chadwick 1,020
Tug Chas. W. Parker, jr.—
Barge Clara, N. E. C. & C. Co 1,450
Barge Potomac, N. E. C. & C. Co 1,200
Barge Edith, N. E. C. & C. Co 1,500
Passed, westbound, tug Walter A. Luckenbach, towing 3 barges, Luck. S. S. Co 3,000

In canal:		Around cape:	
Tugs	4	Tugs	12
Barges	6	Barges	31
Schooners	1	Schooners	12
Sloops	2	Steamers	5
Yachts	1	Tonnage, estimated	48,767
Tonnage, estimated	6,874		

MAY 10, 1916.

Passed east:
Schooner Donna T. Briggs 204
Schooner St. Croix 234
Schooner Charles E. Wyman 234
Schooner Jesse Hart 2d 255
Schooner Helen 149
Schooner Susan P. Oliver 272
Schooner Mary Ann McCann 178
Schooner Sarah A. Reed 158
Schooner Roger Drury 360
Schooner Melissa Webster 10
Barge Duke 700
Passed west:
Schooner Mary B. Wellington 426
Schooner Wesley Abbott 144
Lighter Cornelia 285
Sloop May 10
Sloop Scola 10
Sloop Adventure 10
3,639

BOSTON.

Arrived:	
Steamer Dorchester from Baltimore, Mer. & Min. T. Co	2,537
Steamer Parthian from Philadelphia, Mer. & Min. T. Co	2,082
Steamer Jas. S. Whitney from New York, Eastern S. S. Co	2,707
Tug Edgar F. Luckenbach, barge Genl. Know, Luckenbach S. S. Co	1,587
Tug Tacony—	
Barge Malvern, Sus. Coal Co	1,200
Barge Upton, Sus. Coal Co	1,200
Barge Oxford, Sus. Coal Co	1,200
Tug Nottingham—	
Barge L. & W. C. Co. No. 5, L. & W. Coal Co	1,100
Barge L. & W. C. Co. No. 9, L. & W. Coal Co	1,100
Barge Wilkesbarre, L. & W. Coal Co	2,200
Steamed:	
Steamer Howard for Norfolk, Mer. & Min. T. Co	3,581
Steamer Malden for Norfolk, N. E. C. & Coke Co	5,107
Steamer Everett for Lamberts Point, N. E. C. & Coke Co	5,107
Tug Conestoga—	
Barge Beechwood, Reading R. R	841
Barge Hammond, Reading R. R	693
Barge Ontelaunce, Reading R. R	739
Tug M. Moran, Moran T. Co	256
Tug Sea King—	
Barge Annie, N. E. C. & C. Co	1,098
Barge Cassie, N. E. C. & C. Co	948
Barge Nanticoke, N. E. C. & C. Co	1,000
Chatham, weather SW., strong breeze, cloudy:	
Passed west, steamer Hampden, Coastwise S. S. Co	4,725
Passed east, tug Cuba—	
Barge Cardenas, Staples T. Co	2,900
Barge Mount Hope, Staples T. Co	3,350
Passed west, tug Mars, towing 2 barges, F. W. Munn	1,400
Highland Light, weather cloudy and threatening, smooth sea:	
Passed west—	
Steamer H. M. Whitney, Eastern S. S. Co	2,706
Tug Gwalia—	
Barge Beattie, N. E. C. & Coke Co	1,117
Barge Helen, N. E. C. & Coke Co	1,285
Barge Portsmouth, N. E. C. & Coke Co	1,000
Tug M. E. Luckenbach—	
Barge City of Washington, Luck. S. S. Co	2,410
Barge Josephus, Luck. S. S. Co	1,406
Tug Thomas J. Scully, Luck. S. S. Co	405
Passed east—	
Tug Valley Forge, towing 3 barges, Reading R. R	4,000
Steamer Bay View, White Oak T. Co	1,399
Passed west, steamer Baracoa (Nor.)	2,000
Nobska, May 10, weather 5 p. m. SW., 18 miles, cloudy:	
Passed west—	
Steamer City of Atlanta for Savannah, Ocean S. S. Co	5,433
Tug Lehigh—	
Barge No. 790, Lehigh Valley	900
Barge No. 781, Lehigh Valley	931
Barge No. 791, Lehigh Valley	600
Vineyard Haven, weather a. m. wind variable, light; p. m. S., fresh, cloudy:	
Arrived westbound—	
Schooner William Mason	465
Schooner Moonlight	198
Schooner John G. Walter (Br.)	258
Schooner Julia Frances	183
Passed east—	
Steamer Montara, Pacific Coast S. S. Co	2,562
Steamer Onondaga, Clyde S. S. Co	2,696
Tug Plymouth, towing 3 barges, L. & W. Coal Co	3,000
	83,612

In canal:		Around cape:	
Barges	1	Steamers	13
Lighters	1	Tugs	14
Schooners	12	Barges	31
Sloops	3	Schooners	4
Tonnage estimated	3,639	Tonnage estimated	83,612

MAY 11, 1916.

Passed east:

Schooner Fannie & Fay	233
Schooner J. Arthur Lord	212
Schooner Gilbert Stancliffe	117
Tug Petrel—	
Barge Pittston, Erie R. R.	700
Barge Riverside, Erie R. R.	800
Barge Troy, Erie R. R.	700
	2,762

BOSTON.

Arrived:

Steamer Nantucket from Norfolk, Mer. & Min. T. Co	2,599
Schooner Edwin G. Farrar from Charleston	556
Tug Georges Creek—	
Barge No. 17, Consolidation C. Co	1,600
Barge No. 5, Consolidated C. Co	1,600
Barge No. 15, Consolidation C. Co	1,600
Steamed, steamer Colorado, Mallory S. S. Co	2,764
Highland Light, weather W. 22 miles, clear, smooth sea:	
Passed west—tug Patience—	
Barge Brookside, Reading R. R.	841
Barge Suffolk, Reading R. R.	855
Barge Yardley, Reading R. R.	963
Nobska, weather 5 p. m. W., 17 miles, clear:	
Passed, steamer Jonancy for Boston.	
Passed eastbound, tug Gypsum King, towing 3 barges, J. B. King Co	2,400
Passed westbound, tug Tamaqua—	
Barge Barry, Reading R. R.	954
Barge Plymouth, Reading R. R.	700
Vineyard Haven, weather SW., strong, rough sea, foggy:	
Arrived—	
Steamer Bay State for Norfolk, White Oak T. Co	1,245
Eastbound, schooner McClure (Br.)	220
Westbound—	
Schooner Charles H. Klinck	522
Schooner Colin C. Baker	410
Eastbound, tug Piedmont—	
Barge No. 7, Consolidated C. Co	1,600
Barge No. 24, Consolidated C. Co	2,800
East, steamer William Chisholm, Seaboard T. Co	1,581
	25,810

In canal:		Around cape:	
Tugs	1	Tugs	5
Barges	3	Barges	13
Schooners	3	Schooners	4
Tonnage, estimated	2,762	Steamers	5
		Tonnage, estimated	25,810

MAY 12, 1916.

Passed east:

Steamer H. F. Dimock, Eastern S. S. Co	2,625
Tug Triton	259
Tug Bristol—	
Barge Greenwood, L. C. & N. Co	1,500
Barge Tamaqua, L. C. & N. Co	1,200
Barge Sharon, L. C. & N. Co	825
Passed west, tug Wm. Y. Yerkes, barge Allentown, Chadwick Co	1,200
	7,609

BOSTON.

Arrived:
- Steamer Kershaw from Baltimore, Mer. & Min. T. Co. 2,599
- Steamer Indian from Philadelphia, Mer. & Min. T. Co. 2,110
- Steamer J. H. Devereux from Newport News. 1,618
- Steamer City of Augusta from Savannah, Ocean S. S. Co. 2,869

Steamed:
- Steamer Kandahar (Br.) for New York.
- Steamer Nantucket for Newport News, Mer. & Min. T. Co. 2,599
- Steamer Suffolk for Norfolk, Coastwise S. S. Co. 2,718
- Steamer Pathfinder for New York. 2,424
- Tug Nottingham—
  - Barge No. 2, L. & W. Coal Co. 1,500
  - Barge No. 7, L. & W. Coal Co. 1,100
  - Barge No. 8, L. & W. Coal Co. 1,500
- Tug Chas. W. Parker, jr.—
  - Barge Biwabik, N. E. C. & Coke Co. 1,000
  - Barge Irene, N. E. C. & Coke Co. 1,206
  - Barge Flora, N. E. C. & Coke Co. 800

Highland Light, weather 5 p. m. NW., 12 miles, clear:
- Passed steamer North Star, Eastern S. S. Co. 3,159
- Passed tug Richard F. Young, towing 2 barges. 2,000

Chatham, weather 5 p. m. W., fresh breeze, clear.

Nobska, weather WNW., 12 miles, clear:
- Passed steamer Parthian for Philadelphia, Mer. & Min. T. Co. 2,082
- Passed westbound, tug Conestoga—
  - Barge Beechwood, Reading. 841
  - Barge Hammond, Reading. 693
  - Barge Ontelaunce, Reading. 739

Vineyard Haven, weather W., strong, clear, choppy sea:
- Arrived eastbound—
  - Schooner F. G. French (Br.). 200
- Tug Swatara—
  - Barge Franklin, Reading. 1,500
  - Barge Oley, Reading. 3,000
  - Barge Tohickon, Reading. 1,175
- Passed westbound, tug Standard, towing 2 barges, Standard T. Co. 1,600
- Passed eastbound, tug Paoli, towing 2 barges, Sus. Coal Co. 2,000

43,032

In canal:		Around cape:	
Steamers	1	Steamers	10
Tugs	3	Tugs	7
Barges	4	Barges	18
Tonnage estimated	7,609	Schooners	1
		Tonnage estimated	43,032

MAY 14, 1916.

Passed west:
- Tug Perth Amboy, towing 3 barges, Lehigh Valley. 2,400
- Steamer William Chisholm, Seaboard T. Co. 1,581
- Sloop Albion. 20
- Sloop Helen M. 31
- Sloop Quakeress. 20

Passed east, yacht Bostonia. 25

4,077

BOSTON.

Arrived:
- Tug Cheektowaga—
  - Barge 792, Lehigh Valley. 850
  - Barge 783, Lehigh Valley. 1,625
  - Barge 766, Lehigh Valley. 910
- Tug Catawissa—
  - Barge Preston, Reading R. R. 1,450
  - Barge Paxtang, Reading R. R. 1,550
  - Barge Marion, Reading R. R. 1,550
- Steamer Lexington from Norfolk, Mer. & Min. T. Co. 2,092
- Steamer Tuscan from Philadelphia, Mer. & Min. T. Co. 2,415

Steamed:
Tug Edgar F. Luckenbach—
Barge J. B. Walker, Luck S. S. Co..... 2,136
Barge Washington, Luck S. S. Co..... 1,724
Steamer J. H. Devereux for Norfolk..... 1,618
Steamer Coastwise for Newport News, Coastwise S. S. Co..... 4,015
Steamer Currier for New York, Cuba Dis. Co..... 4,711
Vineyard Haven, weather a. m. variable, light; p. m., SW., fresh, cloudy:
Sailed eastbound, schooner Harry W. Lewis (Br.)..... 305
Sailed westbound—
Schooner Brigadier..... 310
Schooner William Booth..... 545
Passed westbound—
Steamer Philadelphia for New York..... 1,306
Tug Mars, barges Elk Garden, F. W. Munn..... 800
Schooner Horace A. Stone..... 1,376
Schooner George R. Stetson..... 675
Tug Carlisle, towing 3 barges, Reading..... 2,400
Tug Lykens, towing 3 barges, Reading..... 2,400
Tug Georges Creek—
Barge 5, Consolidation..... 909
Barge 15, Consolidation..... 912
Barge 17, Consolidation..... 935
Passed eastbound—
Steamer Dorothy.....
Motor steamer California (Dan.).....
Schooner James Young..... 261
Tug Chas. P. Greenough, towing 2 barges, C. T. B..... 1,600
Tug Murrell, towing 1 barge, N. E. C. & Coke Co..... 800
Steamed westbound, tug Gwalia, towing 3 barges, N. E. C. & Coke Co.. 2,400
Sailed westbound—
Schooner Samuel Castner..... 239
Schooner Longfellow..... 267

45,086

In canal:		Around cape:	
Steamers	1	Steamers	8
Tugs	1	Tugs	9
Barges	3	Barges	24
Sloops	3	Schooners	8
Yacht	1	Tonnage estimated	45,086
Tonnage estimated	4,077		

MAY 15, 1916.

Westbound, barge Sharon, Staples T. Co..... 482
Eastbound, tug May:
Barge Calvin, Chadwick Co..... 1,000
Barge Elizabeth, Chadwick Co..... 1,000
Sloop Gracie G..... 6
Westbound, auxiliary sloop Julita..... 30

2,518

BOSTON.

Arrived:
Steamer Nacoochee from Savannah, Ocean S. S. Co..... 2,680
Steamer Ontario from Baltimore, Mer. & Min. T. Co..... 3,099
Steamer City of Everett, Standard T. Co..... 2,595
Steamed:
Steamer Wagama (Nor.) for New York.....
Steamer Middlesex for Norfolk, Coastwise S. S. Co..... 4,727
Steamer Lexington for Norfolk, Mer. & Min. T. Co..... 2,092
Highland Light, weather 5 p. m. E., 10 miles, foggy.
Chatham, weather 5 p. m. NE., light breeze, foggy:
Passed steamer Arlington for Norfolk, N. E. C. & Coke Co..... 1,446
Passed steamer Melrose for Norfolk, N. E. C. & Coke Co..... 5,107

Nobska, weather SE., 16 miles, fog and rain:
Passed west—
Steamer Bay View, White Oak T. Co..... 1,399
Steamer Onondaga, Clyde S. S. Co..... 2,696
Steamer Santurce, N. Y. & Porto Rico S. S. Co..... 1,836
Tug Tacony—
Barge Upton, Susquehanna C. Co..... 843
Barge Radnor, Susquehanna C. Co..... 678
Barge Strafford, Susquehanna C. Co..... 678
Vineyard Haven:
Arrived eastbound—
Tug Mercury—
Barge Pocono, Chadwick Co..... 1,100
Barge Canisteo, Chadwick Co..... 1,020
Barge Musconetcong, Chadwick Co..... 1,375
Tug Lehigh—
Barge No. 703, Lehigh Valley R. R..... 1,620
Barge No. 704, Lehigh Valley R. R..... 1,620
Barge No. 790, Lehigh Valley R. R..... 900
Passed steamer San Saba for Boston..... .....

In canal:		Around cape:	
Tug	1	Steamers	12
Barges	3	Tugs	3
Sloops	2	Barges	9
Tonnage estimated	2,518	Tonnage estimated	37,511

MAY 16, 1916.

Passed east, sloop Lottie Merchant..... 25

BOSTON.

Arrived, steamer Dorchester from Norfolk, Mer. & Min. T. Co..... 2,537
Steamed:
Steamer Tuscan for Philadelphia, Mer. & Min. T. Co..... 2,415
Steamer Ontario for Norfolk, Mer. & Min. T. Co..... 3,099
Steamer Ramfos (Nor.) for New York..... 2,172
Steamer Nacoochee for Savannah, Ocean S. S. Co..... 2,680
Steamer Everett for Newport News, N. E. C. & Coke Co..... 5,107
Steamer Jelling (Dan.) for New York..... 2,639
Steamer Joancy for Norfolk..... .....
Highland Light, weather 5 p. m. SE., 22 miles, foggy.
Chatham, weather 5 p. m. E., fresh breeze, foggy:
Passed steamer H. M. Whitney, Eastern S. S. Co..... 2,706
Passed tug Gypsum King, towing 3 barges, J. B. King Co..... 3,000
Vineyard Haven, weather E., moderate, thick fog:
Arrived west—
Schooner Mayflower (Br.)..... .....
Tug Swatara, towing 3 barges, Reading R. R..... 2,400
Arrived east—
Tug Ontario, towing 3 barges, N. Y. O. & W. R. R. Co..... 3,000
Tug North America—
Barge No. 3, Chadwick Co..... 1,000
Barge Chemung..... 1,020
Barge Pequest..... 1,375

In canal:		Around cape:	
Sloop	1	Steamers	9
Tonnage estimated	25	Tugs	4
		Barges	12
		Schooner	1
		Tonnage estimated	35,150

MAY 17, 1916.

Passed west, schooner Charles C. Lister 280

BOSTON.

Arrived:
- Steamer Parthian from Philadelphia, Mer. & Min. T. Co 2,082
- Steamer Howard from Baltimore, Mer. & Min. T. Co 3,581
- Steamer H. F. Dimock from New York, Eastern S. S. Co 2,625

Steamed, steamer Dorchester for Baltimore, Mer. & Min. T. Co 2,537
Highland Light, weather SW., 25 miles, cloudy, moderate sea.
Chatham, weather 5 p. m. SW., fresh, fog, clearing:
- Passed steamer North Star, Eastern S. S. Co 3,159

Nobska, weather SE., 38 miles, fog and rain.
Vineyard Haven, weather a. m. SW., thick and rainy, rough; p. m. SW., fresh, clearing:
- Passed, steamer Bay State for Boston, White Oak T. Co 1,245
- Arrived, eastbound, tug Germantown—
  - Barge Leesport, Reading R. R 1,550
  - Barge Robesonia, Reading R. R 1,550
  - Barge Neshaminy, Reading R. R 1,175
- Arrived, westbound, tug Waltham, barge Mount Hope, Staples T. Co. 3,350

In canal:		Around cape:	
Schooner	1	Steamers	6
Tonnage	280	Tugs	2
		Barges	4
		Tonnage, estimated	22,804

MAY 18, 1916.

Passed west:
- Tug Pejepscot—
  - Barge S. T. Co. No. 1, Chadwick Co 800
  - Barge S. T. Co. No. 3, Chadwick Co 800
- Tug Thos. J. Yorke, towing 2 scows 800
- Lighter Cornelia 200
- Tug Chas. Gallagher, barge Henry Endicott, Chadwick Co 866

Passed east:
- Schooner Lizzie J. Call 206
- Schooner Willis & Guy 199
- Tug Chas. Gallagher 90
- Yacht Valiant .....

3,961

BOSTON.

Arrived:
- Massachusetts schoolship Ranger from Hampton Roads 1,261
- Steamer Katahdin from Jacksonville, Clyde S. S. Co 2,696
- Steamer Chippewa from Charleston, Clyde S. S. Co 2,696
- Steamer Kershaw from Norfolk, Mer. & Min. T. Co 2,599
- Steamer Montara from Norfolk, Pac. Coast S. S. Co 2,562
- Steamer Bristol from Norfolk 284
- Steamer Bay State from Newport News, White Oak T. Co 1,245

Steamed, steamer Suffolk for Norfolk, Coastwise S. S. Co 4,718
Steamed westbound:
- Tug Chas. P. Greenough—
  - Barge Salem, Com. T. B. Co 1,159
  - Barge Potomac, Com. T. B. Co 400
  - Barge Iron Queen, Com. T. B. Co 800
- Tug Plymouth—
  - Barge L. & W. No. 5, L. & W. Coal Co 800
  - Barge L. & W. No. 9, L. & W. Coal Co 700
  - Barge L. & W. No. 1, L. & W. Coal Co 800

Highland Light, weather 5 p. m. SW., 25 miles, clear, smooth sea:
Passed—
Steamer Esparta for Port Limon, Esparta S. S. Co..... 3,297
Steamer Jethou (Nor.) for New York..... 4,284
Steamer Jas. S. Whitney for New York, Eastern S. S. Co..... 2,707
Passed westbound—
Tug Paoli—
Barge Oxford, Sus. Coal Co..... 1,802
Barge Haverford, Sus. Coal Co..... 678
Barge Malvern, Sus. Coal Co..... 844
Tug Cheektowaga—
Barge No. 765, Lehigh Valley..... 910
Barge No. 782, Lehigh Valley..... 924
Barge No. 785, Lehigh Valley..... 1,125
Passed, eastbound, tug Gettysburg—
Barge Cocalico, Reading R. R..... 1,550
Barge Exeter, Reading R. R..... 3,000
Barge Saucon, Reading R. R..... 1,550
Chatham; weather 5 p. m., SW.; fresh; clear:
Passed eastbound, tug Lehigh—
Barge 704, Lehigh Valley..... 1,620
Barge 790, Lehigh Valley..... 900
Barge 703, Lehigh Valley..... 1,620
Passed westbound—
Tug Murrell, barge Edith, N. E. C. & Coke Co..... 859
Tug Western—
Barge Ellenville, N. Y., O. & W. R. R. Co..... 858
Barge Smyrna, N. Y., O. & W. R. R. Co..... 741
Barge Pilgrim, N. Y., O. & W. R. R. Co..... 1,000
Passed eastbound—
Tug Lenape—
Barge Skippack, Reading..... 1,175
Barge Merriam, Reading..... 1,450
Barge Maple Hill, Reading..... 1,550
Tug Nottingham—
Barge L. & W. No. 12, L. & W. Coal Co..... 1,550
Two others, L. & W. Coal Co..... 2,200
Vineyard Haven: weather W.; fresh breeze; clear; choppy sea:
Passed, steamer Malden for Norfolk, N. E. C. & Coke Co..... 5,107
Passed, eastbound, tug Lykens, towing 3 barges, Reading..... 3,000
Sailed, westbound, schooner Mayflower (Br.)..... 200

69,171

In canal:		Around Cape:	
Tugs	4	Schoolship	1
Barges	3	Steamers	11
Scows	2	Tugs	11
Lighters	1	Barges	31
Schooners	2	Schooners	1
Yacht	1	Tonnage, estimated	69,171
Tonnage, estimated	3,961		

MAY 19, 1916.

Passed west:
Schooner Arthur M. Gibson..... 131
Schooner Northern Light..... 139
United States fisheries steamer Blue Wing..... 40
Passed east:
Steamer H. M. Whitney, Eastern S. S. Co..... 2,706
Schooner Nellie Eaton..... 118
Launch Manatee..... 10
Passed west, tug Wm. H. Yerkes, barge Greenwood, L. C. & N. Co..... 967
Passed east, tug Wm. H. Yerkes—
Barge Rahn, L. C. & N. Co..... 1,600
Barge Tamaqua, L. C. & N. Co..... 1,200

Passed west, tug Neponset—
Barge Lansford, L. C. & N. Co..... 830
Barge Duke, L. C. & N. Co..... 800

8,541

BOSTON.

Arrived:
Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
Steamer City of Atlanta from Savannah, Ocean S. S. Co..... 5,433
Steamer Nantucket from Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Brandon from Baltimore..... 2,431
Steamer Thistleard from Baltimore.....
Steamer Bay View, White Oak T. Co..... 1,399
Tug A. J. Stone—
Barge Albany, Erie R. R..... 1,120
Barge Passaic, Erie R. R..... 1,525
Barge Scranton, Erie R. R..... 750
Tug Perth Amboy, towing 3 barges, Lehigh Valley..... 3,000
Steamed, steamer Bay State for Sewalls Point, White Oak T. Co..... 1,245
Highland Light; weather N., 22 miles; hazy; moderate sea:
Passed, steamer H. F. Dimock for New York, Eastern S. S. Co..... 2,625
Passed, steamer North Star for Portland, Eastern S. S. Co..... 3,159
Chatham; weather noon, N.; light breeze: clear:
Passed, steamer J. H. Devereux for Boston..... 1,618
Passed, westbound, tug Savage—
Barge No. 8, Con. Coal Co..... 924
Barge No. 18, Con. Coal Co..... 936
Barge No. 20, Con. Coal Co..... 940
Passed, eastbound, steamer Wm. Chisholm, Seaboard T. Co..... 1,581
Nobska; weather 1 p. m., SW.; 10 miles; fair:
Passed, steamer Parthian for Philadelphia, Mer. & Min. T. Co..... 2,082
Passed westbound, tug Boxer, barge Larimer, F. W. Munn..... 800
Passed eastbound, tug International—
Barge Beeckwood, Reading..... 1,250
Barge Langhorne, Reading..... 1,550
Barge Manheim, Reading..... 1,550
Vineyard Haven, weather W., fresh breeze, clear, smooth sea:
Arrived eastbound—
Schooner Lydia H. Roper..... 321
Schooner Wanola..... 314
Tug Tamaqua—
Barge Cacoosing, Reading..... 1,175
Barge Wiconisco, Reading..... 1,550
Tug Conestoga—
Barge Manatawny, Reading..... 1,175
Barge Indian Ridge, Reading..... 1,550
Barge Enterprise, Reading..... 1,550
Tug Honeybrook, towing 3 barges, L. & W. C. Co..... 3,000
Tug Security, towing 1 barge, Stan. T. Co..... 1,000
Arrived westbound, tug Germantown—
Barge Tulpehocken, Reading..... 1,175
Barge Logan, Reading..... 1,550
Barge Cleona, Reading..... 1,550

In canal:		Around cape:	
Steamers	2	Steamers	12
Tugs	3	Tugs	9
Barges	5	Barges	25
Schooners	3	Schooners	2
Launches	1	Tonnage, estimated	56,537
Tonnage, estimated	8,541		

MAY 21, 1916.

Passed east:
Schooner Bill Nye..... 80
Schooner Alberta..... 77
Schooner Mary Weaver..... 222
Tug Prudence, barge Varina..... 441
Steam lighter Cornelia..... 285

Passed west:	
Schooner Monarch	
Schooner Abenaki	176
Schooner Ralph L. Hall	125
Schooner Donna T. Briggs	204
Schooner Buema	
Schooner Rob Roy	785
Schooner Horace M. Bickford	503
Tug Wesley A. Gove, towing schooner Emma	54
Yacht Parthenia	141
Sloop Priscilla	10
Sloop Fawn	12
Sloop Cordelia	10
Sloop Virginia	10
Sloop Candy Kidd	10
Passed east, tug Mariner, towing 2 scows	800
Passed west, tug Mariner	49
Arrived, tug Confidence	53
	4,047

BOSTON.

Arrived:	
Steamer Comanche from Jacksonville, Clyde S. S. Co	3,856
Steamer Ontario from Norfolk, Mer. & Min. T. Co	3,099
Steamer Tuscan from Philadelphia, Mer. & Min. T. Co	2,415
Tug M. Moran—	
Barge Annie H. Smith, Luckenbach S. S. Co	1,487
Barge Old Dominion, Luckenbach S. S. Co	1,802
Tug Walter A. Luckenbach—	
Barge Solitaire, Luckenbach S. S. Co	1,515
Barge West Point, Luckenbach S. S. Co	1,213
Tug Patience—	
Barge Elk Garden, F. W. Munn	1,475
Barge Hampshire, F. W. Munn	1,475
Barge Horace Allyn, F. W. Munn	1,000
Tug Carlisle—	
Barge Pocopson, Reading R. R	1,175
Barge Bethayres, Reading R. R	1,550
Barge Phoenix, Reading R. R	1,550
Tug Tacony, towing barges, Sus. Coal Co	3,000
Steamed:	
Steamer Montara for Newport News, Pac. Coast S. S. Co	2,562
Steamer Brandon for Baltimore	2,431
Steamer Katahdin for Charleston, Clyde S. S. Co	2,696
Steamer Bristol for Norfolk	284
Steamer Coastwise for Baltimore, Coastwise S. S. Co	4,015
Steamer Bay View for Hampton Roads, White Oak T. Co	1,399
Vineyard Haven, weather E., fresh, clear, smooth sea:	
Sailed westbound, schooner Helen Montague	407
Steamed eastbound, tug Petrel, towing 3 barges, Erie R. R	2,400
Arrived eastbound, schooner Manie Saunders	279
Passed—	
Steamer City of Augusta from Savannah, Ocean S. S. Co	2,869
Steamer Jas S. Whitney from New York, Eastern S. S. Co	2,707
Steamer North Star from New York, Eastern S. S. Co	3,159
Steamer North Land for New York, Eastern S. S. Co	3,282
Passed westbound—	
Schooner Frances Goodnow	359
Schooner R. Bowers	435
Schooner Barbara	838
Passed eastbound, tug Gwalia—	
Barge Annie, N. E. C. & C. Co	1,500
Barge Portsmouth, N. E. C. & C. Co	2,650
Barge Providence, N. E. C. & C. Co	2,650
Passed westbound, tug Cumberland—	
Barge No. 21, Con. Coal Co	905
Barge No. 23, Con. Coal Co	900

Vineyard Haven—Continued.
Passed eastbound, tug Gypsum King, towing 3 barges, J. B. King Co... 2,400
Passed westbound—
Tug Nottingham, towing 3 barges, L. & W. Coal Co..... 2,400
Tug Valley Forge—
Barge Oley, Reading R. R..... 1,780
Barge Mahanoy, Reading R. R..... 855
Barge Molinio, Reading R. R..... 954
Schooner Harold B. Cousens..... 379
Schooner Moama (Br.)..... 404

In canal:		Around cape:	
Tugs	5	Tugs	10
Barges and scows	3	Barges	30
Schooners	11	Steamers	13
Steam lighter	1	Schooners	7
Yacht	1	Tonnage, estimated	74,511
Sloops	5		
Tonnage, estimated	4,047		

MAY 22, 1916.

Passed west:
Tug May—
Barge Calvin..... 415
Barge Elizabeth..... 440
Sloop White Cap..... 10
Schooner Thelma..... 525
Steamer Massachusetts, Eastern S. S. Co..... 4,779
6,169

BOSTON.

Arrived:
Steamer Gloucester from Baltimore, Mer. & Min. T. Co..... 2,541
Steamer Bylayl from Norfolk.....
Steamer Melssonier (Br.) from New York.....
Tug Concord—
Barge Chatham, Staples T. Co..... 3,350
Barge Havanna, Staples T. Co..... 2,900
Barge Tipton, Staples T. Co..... 1,530
Steamed:
Steamer Ontario for Baltimore, Mer. & Min. T. Co..... 3,099
Steamer Arlington for Baltimore, N. E. C. & C. Co..... 2,431
Steamer Melrose for Newport News, N. E. C. & C. Co..... 5,107
Steamer City of Augusta for Savannah, Ocean S. S. Co..... 2,869
Steamer William Chisholm for Newport News, Seaboard T. Co..... 1,581
Tug Cumberland—
Barge No. 7, Consolidation C. Co..... 898
Barge No. 24, Consolidation C. Co..... 1,566
Highland light, weather 5 p. m. SW., 27 miles, cloudy, smooth sea:
Passed eastbound—
Tug Catawissa—
Barge Suffolk, Reading R. R..... 1,450
Barge Cumru, Reading R. R..... 3,000
Barge Temple, Reading R. R..... 1,550
Tug Scranton—
Barge Summitt Hill, L. C. & N. Co..... 1,000
Barge Hauto, L. C. & N. Co..... 1,200
Barge Shickshinney, L. C. & N. Co..... 1,350
Chatham, weather 5 p. m. S., fresh, clear:
Passed westbound, tug Thos. J. Scully—
Barge Carrie Clark, Luck S. S. Co..... 1,298
Barge Genl. Knox, Luck S. S. Co..... 1,587
Nobska, weather SW., 5 miles, clear:
Passed westbound, tug Lenape—
Barge Pickering, Reading R. R..... 739
Barge Pennypack, Reading R. R..... 739
Barge Monitor, Reading R. R..... 955

Vineyard Haven, weather, a. m., variable, light breeze; p. m., S., moderate, clear:
Arrived—
East, schooner James B. Drake 1,153
West, schooner B. H. Warfield 203
East, tug Georges Creek, towing 3 barges, Consol. Coal Co 3,000
West, steamer Millinocket, A. H. Bull S. S. Co 3,336
West, tug M. Moran, barge Joaquin, Luck. S. S. Co 1,551
East, schooner Thos. H. Lawrence 374
52,357

In canal:		Around cape:	
Steamers	1	Steamers	9
Tugs	1	Tugs	8
Barges	2	Barges	20
Sloops	1	Schooners	3
Schooners	1	Tonnage, estimated	52,357
Tonnage, estimated	6,619		

MAY 23, 1916.

Passed east:
Tug Pejepscot, barge Allentown, L. C. & Nav. Co 1,200
Tug Neponset—
Barge Ida Woods, James Hughes 1,000
Barge Mary Horan, James Hughes 1,000
Tug June—
Dredge Capitol 414
Two scows 600
Tug Herald, barge Northern No. 2 800
Passed west:
Tug Herald 50
Schooner Henrietta 99
Sonder Panther 5
Sloop Actives 10
Steamer Bunker Hill, East. S. S. Co 4,779
9,957

BOSTON.

Arrived:
Steamer Howard, from Norfolk, Mer. & Min. T. Co 3,581
Tug Standard—
Barge, S. T. Co., No. 5, Standard T. Co 1,000
Barge, S. T. Co., No. 123, Standard T. Co 1,000
Tug Swatara—
Barge Kimberton, Reading R. R 1,550
Barge Barry, Reading R. R 1,550
Barge Ontelaunce, Reading R. R 1,175
Tug Mars, Barge Reading, F. W. Munn 2,100
Steamed:
Steamer Gloucester, for Norfolk, Mer. & Min. T. Co 2,541
Steamer Tuscan, for Philadelphia, Mer. & Min. T. Co 2,415
Steamer Everett, for Newport News, N. E. C. & C. Co 5,107
Tug Tacony, barge Devon, Sus. Coal Co 724
Highland Light, weather, 5 p. m., SE., 20 miles, cloudy, smooth sea:
Passed westbound, tug Security, barge No. 57, Standard T. Co 800
Chatham, weather, 5 p. m., SSE., fresh breeze, cloudy:
Passed westbound, tug Mercury—
Barge, S. T. Co., No. 4, Chadwick Co 700
Barge, R. & R. L. Co., No. 1, Chadwick Co 800
Barge Cohocton, Chadwick Co 700
Nobaska, weather, S., 4 miles, cloudy:
Passed westbound, tug Ontario—
Barge Cadosia, N. Y., O. & W. R. R. Co 756
Barge Liberty, N. Y., O. & W. R. R. Co 856
Barge Metacomet, N. Y., O. & W. R. R. Co 850
Passed west, tug Lykens—
Barge Cacoosing, Reading 721
Barge Skippack, Reading 739

Vineyard Haven, weather S., moderate; cloudy; smooth sea:
Arrived eastbound—
Schooner Adonis (Br.)
Tug Checktowaga—
Barge No. 700, Lehigh Valley 1,620
Barge No. 780, Lehigh Valley 1,625
Tug Boswell—
Barge Biwabik, N. E. C. & C. Co 1,200
Barge Helen, N. E. C. & C. Co 2,400
Barge John B. Winstead, N. E. C. & C. Co 1,000
Arrived westbound, tug Honeybrook—
Barge No. 7, L. & W. C. Co 700
Barge No. 31, L. & W. C. Co 700
Barge No. 11, L. & W. C. Co 900

In Canal:		Around Cape:	
Steamers	1	Steamers	4
Tugs	5	Tugs	11
Barges	4	Barges	24
Schooners	1	Schooners	1
Sloops	1	Tonnage, estimated	39,810
Sonder	1		
Dredge	1		
Scows	2		
Tonnage, estimated	9,957		

MAY 24, 1916.

Passed east:
Steamer Massachusetts, Eastern S. S. Co 4,779
Steamer Bunker Hill, Eastern S. S. Co 4,779
Submarine tender Bushnell 3,580
Submarine L1 100
Submarine L3 100
Submarine L4 100
Passed west:
Schooner Bill Nye 80
Tug Pejepscot, barge Pequest, Chadwick Co 800
Yacht Hessian 23
Sloop St. John 10
Sloop Christopher 10
Sloop Mary L 10
Schooner Alberta 77
Schooner Vernon 21
Passed east, tug Peerless, barge Caddo, Texas Oil Co 1,000

15,469

BOSTON.

Arrived:
Steamer Parthian from Philadelphia, Mer. & Min. T. Co 2,082
Steamer Juniata from Baltimore, Mer. & Min. T. Co 3,465
Steamer H. M. Whitney from New York, Eastern S. S. Co 2,706
Steamed:
Steamer Howard for Newport News, Mer. & Min. T. Co 3,581
Steamer Malden for Baltimore, N. E. C. & Coke Co 5,107
Steamer Noruega (Nor.) for Philadelphia 3,643
Steamer Santa Rosalia (Ital.) for New York 1,226
Steamer Boveric (Br.) 4,445
Tug Patience—
Barge Chas. F. Pritchard, F. W. Munn 861
Barge Harrisburg, F. W. Munn 1,283
Tug Swatara—
Barge Richardson, Reading 693
Barge Beechwood, Reading 841
Barge Manheim, Reading 955
Tug Carlisle—
Barge Enterprise, Reading 901
Barge Brookside, Reading 841
Barge Buck Ridge, Reading 915

Steamed—Continued.
Tug Standard—
Barge No. 5, Standard T. Co..... 800
Barge No. 123, Standard T. Co..... 800
Highland Light, weather 5 p. m., SW., 25 miles, hazy, smooth sea:
Passed—
Steamer City of Augusta, Ocean S. S. Co..... 2,869
Steamer North Land, Eastern S. S. Co..... 3,282
Tug Triton, Lamberts Pt. T. B. Co..... 259
Chatham, weather 5 p. m., SW., fresh breeze, cloudy.
Nobska, 1.40 p. m., weather SW., 7 miles, light fog:
Passed west—
Steamer Chippewa, Clyde S. S. Co..... 2,696
Steamer H. F. Dimock, Eastern S. S. Co..... 2,625
Passed east, steamer Bay State, White Oak T. Co..... 1,245
Vineyard Light, weather S., moderate, foggy, smooth sea:
Arrived westbound, schooner Nellie J. King (Br.)..... 200

In canal:		Around cape:	
Steamers	2	Steamers	13
Submarine tender	1	Tugs	5
Submarines	3	Barges	10
Tugs	2	Schooners	1
Barges	2	Tonnage estimated	48,321
Schooners	3		
Sloops	3		
Yacht	1		
Tonnage, estimated	15,469		

MAY 25, 1916.

Passed east, steamer Bunker Hill, Eastern S. S. Co..... 4,779
Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Tug Petrel—
Barge Edgewater, Erie R. R..... 864
Barge Passaic, Erie R. R..... 875
Barge Pittston, Erie R. R..... 466
Steam yacht Florence..... 104
Lighter Cornelia..... 285
Tug Prudence, barge Varina..... 441
Tug Wm. H. Yerkes—
Barge Tamaqua, Lehigh Coal & N. Co..... 830
Barge Coaldale, Lehigh Coal & N. Co..... 831
Passed east—
Tug Wm. H. Yerkes, barge Canton, Lehigh Coal & N. Co..... 897
Yacht Kestrel II..... 99

15,250

BOSTON.

Arrived, steamer Onondaga from Charleston, Clyde S. S. Co..... 2,696
Steamed, tug C. W. Parker, Jr.—
Barge Sweetser, N. E. C. & Coke Co..... 700
Barge Linthicum, N. E. C. & Coke Co..... 700
Barge Annie, N. E. C. & Coke Co..... 1,098
Barge Clara, N. E. C. & Coke Co..... 828
Highland Light, weather 5 p. m., SW., 15 miles, clear, smooth sea:
Passed westbound—
Tug Georges Creek—
Barge No. 5, Consolidation C. Co..... 909
Barge No. 23, Consolidation C. Co..... 1,000
Tug Calvert—
Barge Scranton, Erie R. R..... 400
Barge Riverside, Erie R. R..... 700

Chatham, weather 5 p. m., SW., moderate breeze, fog clearing:
Passed east—
Tug Piedmont—
Barge No. 10, L. C. & Nav. Co..... 1,500
Barge No. 25, L. C. & Nav. Co..... 1,000
Steamer Nantucket, Mer. & Min. T. Co..... 2,599
Vineyard Haven, weather SW., fresh breeze, choppy sea, foggy:
Arrived westbound, steamer Bay Port, White Oak T. Co..... 1,399
Arrived eastbound—
Schooner Nellie Grant..... 19
Schooner Lavolta..... 204
Schooner Jesse Ashley (Br.)..... 143
Tug Nottingham—
Barge No. 15, L. & W. Coal Co..... 1,500
Barge No. 9, L. & W. Coal Co..... 1,100
Tug Perth Amboy, towing 3 barges, Lehigh Valley..... 2,500
Tug Cuba—
Barge Cardenas, Staples T. Co..... 2,900
Barge Foster, Staples T. Co..... 1,530
Barge Gibson, Staples T. Co..... 1,530
Arrived west bound—
Tug Tacony—
Barge Brookside, Reading R. R..... 841
Barge Enterprise, Reading R. R..... 901
Barge Buck Ridge, Reading R. R..... 915
Tug Edgar F. Luckenbach—
Barge Washington, Luck. S. S..... 1,724
Barge J. B. Walker, Luck. S. S..... 2,136

33,472

In canal:		Around cape:	
Steamer	2	Steamer	3
Tugs	4	Tugs	9
Barges	7	Barges	22
Steam yacht	1	Schooners	3
Steam lighter	1	Tonnage estimated	33,472
Motor yacht	1		
Tonnage estimated	15,250		

MAY 26, 1916.

Passed west, steamer Bunker Hill, East. S. S. Co..... 4,779
Passed east, steamer Massachusetts, East. S. S. Co..... 4,779
Passed west:
Schooner Samuel Hart..... 210
Schooner Maggie Todd..... 136
Schooner Ida B. Gibson..... 2,355
Schooner Itasca..... 75
Schooner Oaks Ames..... 254
Passed East:
Steam lighter Cornelia..... 285
Tug A. J. Stone, towing 3 barges, Erie R. R..... 3,000
Passed west, tug Leader, barge Remus..... 531
Passed east, tug Narragansett, barge Braddock, Staples T. Co..... 900

15,184

BOSTON.

Arrived:
Steamer Dorchester from Baltimore, Mer. & Min. T. Co..... 2,537
Steamer Indian from Philadelphia, Mer. & Min. T. Co..... 2,110
Steamer Nacoochee from Savannah, Ocean S. S. Co..... 2,680
Steamer Brandon from Baltimore, N. E. C. & Coke Co..... 2,431
Steamer Montara from Newport News, Pacific Coast Co..... 2,562
Steamer Jas. S. Whitney of New York, Eastern S. S. Co..... 2,707
Tug M. E. Luckenbach—
Barge Josephus, Luck. S. S. Co..... 1,406
Barge City of Washington, Luck. S. S. Co..... 2,410

Steamed:
Steamer Hylas (Br.) for New York..... 4,233
Steamer Nantucket for Newport News, Mer. & Min. T. Co..... 2,599
Highland Light, weather 5 p. m. NNE., 12 miles, clear; smooth sea.
Chatham, weather 5 p. m. N., light; clear:
Passed east—
Tug Plymouth—
Barge No. 2, L. & W. Coal Co..... 1,500
Barge No. 8, L. & W. Coal Co..... 1,500
Barge No. 14, L. & W. Coal Co..... 1,500
Steamer H. F. Dimock, Eastern S. S. Co..... 2,625
Tug Prudence—
Barge Penn, F. W. Munn..... 3,400
Barge Harvard, F. W. Munn..... 2,100
Barge Lincoln, F. W. Munn..... 1,450
Passed west—
Steamer Suffolk, Coastwise S. S. Co..... 4,718
Steamer Comanche, Clyde S. S. Co..... 3,856
Nobska, weather 4.30 p. m. SW., 5 miles, clear:
Passed west, tug Mars—
Barge Elk Garden, F. W. Munn..... 800
Barge H. A. Allyn, F. W. Munn..... 800
Barge Wiconisco, F. W. Munn..... 956
Passed east, tug Monocacy—
Barge Silver Brook, Reading..... 1,550
Barge Tamanend, Reading..... 1,175
Barge Bear Ridge, Reading..... 1,550
Passed west, tug Tacony—
Barge Devon, Sus. Coal Co..... 724
Barge Nanticoke, Sus. Coal Co..... 1,000
Passed east—
Tug Tamaqua—
Barge Rutherford, Reading R. R..... 1,550
Barge Tulpehocken, Reading R. R..... 1,175
Barge Oak Hill, Reading R. R..... 1,550
Tug Germantown—
Barge Henry Clay, Reading R. R..... 1,150
Barge Macungie, Reading R. R..... 1,550
Barge Tabor, Reading R. R..... 1,550
Passed west—
Tug Catawissa—
Barge Exeter, Reading R. R..... 1,780
Barge Mantawny, Reading R. R..... 721
Barge Yardley, Reading R. R..... 963
Tug Gwalia—
Barge Providence, N. E. C. & Coke Co..... 1,800
Barge Emelie, N. E. C. & Coke Co..... 1,069
Vineyard Haven, weather, wind variable, light, clear, smooth sea:
Arrived east—
Tug Patience, towing 3 barges, F. W. Munn..... 3,000
Schooner Percy C. (Br.).....
Tug Sea King, barge Plymouth..... 800
Tug Eureka, towing 1 barge..... 800
Arrived west, tug Scranton, barge R. & R. L. Co. 6, Potter S. S. Co..... 800

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	3	Tugs	14
Barges	5	Barges	33
Steam lighter	1	Schooners	1
Schooners	5	Tonnage estimated	77,137
Tonnage estimated	15,184		

MAY 28, 1916.

Passed west:	
Steamer Bunker Hill, East. S. S. Co	4,77)
Tug Neponset—	
Barge Helen Wood, James Hughes	565
Barge Dorothy Price	469
Schooner Lizzie D. Small	190
Schooner Cora M	143
Sloop Wasaka	24
Schooner yacht India	69
Motor boat Wild Goose	8
Motor boat Countess	21
Motor boat Edamena	56
Passed east:	
Steamer Massachusetts, Eastern S. S. Co	4,779
Schooner Sallie E. Ludlam	237
Sloop Odell	141
Sloop Stranger	9
Sloop Aphrodite	10
Sloop Elena	206
Sloop Little Fannie	23
Tug Pejepscot, towing 3 barges, Chadwick Co	3,000
	14,609

BOSTON.

Arrived:	
Tug Paoli—	
Barge Oxford, Sus. Coal Co	1,200
Barge Malvern, Sus. Coal Co	1,200
Tug Western—	
Barge Sydney, N. Y. O. & W. R. R. Co	1,275
Barge Pilgrim, N. Y. O. & W. R. R. Co	2 250
Barge Smyrna, N. Y. O. & W. R. R. Co	1 275
Tug Gettysburg—	
Barge Spring, Reading R. R	3,000
Barge Preston, Reading R. R	1,450
Barge Logan, Reading R. R	1,550
Steamer Gloucester from Philadelphia, Mer. & Min. T. Co	2,541
Steamed:	
Tug Prudence, barge Reading, F. W. Munn	1,700
Tug S. T. Co. No. 2, barge S. T. Co. No. 24, Standard T. Co	800
Vineyard Haven, weather S., moderate, smooth sea, thick and rainy:	
Arrived eastbound—	
Schooner Winchester	303
Tug Chas. Greenough, towing 3 barges, Com. T. B. Co	3,000
Tug Savage, towing 3 barges, Consolidation C. Co	3,000
Tug Mercury, towing 3 barges, Boston T. B. Co	3,000
Schooner Abbie S. Walker	190
Passed westbound—	
Schooner Thos. W. H. White	213
Schooner Hortensia	189
Tug Monocacy—	
Barge Ontelaunce, Reading R. R	739
Barge Robesonia, Reading R. R	955
Barge Phoenix, Reading R. R	901
Tug Edgar F. Luckenbach, barge Old Dominion, Luck. S. S. Co	1,802

In canal:	
Steamers	2
Tugs	2
Barges	5
Schooners	3
Sloops	5
Schooner yachts	2
Motor boats	3
Tonnage, estimated	14,609

Around cape:	
Steamer	1
Tugs	10
Barges	23
Schooners	4
Tonnage, estimated	32,533

MAY 30, 1916.

Passed west:	
Steamer Bunker Hill, Eastern S. S. Co	4,779
Tug S. T. Co. No. 2, barge 124, Standard T. Co	700
Steamer Kearsarge	16
Yacht Margaret	161
Steam lighter Cornelia, Boston Sand & G. Co	285
The Pejepscot, towing 1 barge, Chadwick Co	700
Motor boats—	
Sadie	9
May	10
Reita	13
Passed east: Steamer Massachusetts, Eastern S. S. Co	4,779
	11,452

BOSTON.

Arrived:	
Steamer City of Atlanta, from Savannah, Ocean S. S. Co	5,433
Steamer Juniata, from Norfolk, Mer. & Min. T. Co	3,465
Steamed:	
Steamer St. Patrick (Br.), for New York	4,257
Steamer Kershaw, for Norfolk, Mer. & Min. T. Co	2,599
Steamer Tuscan, for Philadelphia, Mer. & Min. T. Co	2,415
Steamer Hampden, for Baltimore, Coastwise S. S. Co	4,725
Steamer Bay View, for Newport News, White Oak T. Co	1,399
Tug Boswell—	
Barge Irene, N. E. C. & C. Co	1,206
Barge Helen, N. E. C. & C. Co	1,285
Barge Hattie, N. E. C. & C. Co	1,286
Vineyard Haven:	
Arrived eastbound—	
Tug John Scully, barge I. F. Chapman.	
Tug Thos. J. Scully—	
Barge Genl. Knox.	
Barge Carrie Clark.	
These barges belong to Luckenbach Steamship Co., and could not use canal account drawing too much water.	
Arrived westbound, tug Tamaqua, towing 3 barges, Reading R. R	2,200

In canal:		Around cape:	
Steamers	3	Steamers	7
Tugs	2	Tugs	3
Barges	2	Barges	6
Yacht	1	Tonnage, estimated	30,270
Steam lighter	1		
Motor boats	3		
Tonnage, estimated	11,452		

MAY 31, 1916.

Passed west:	
Schooner Harriet C. Whitehead	222
Tug Neptune towing—	
Dredge Narragansett	600
2 scows	400
Steamer Massachusetts, Eastern S. S. Co	4,779
Passed east:	
Steam lighter Seabury, towing lighter Raymond	326
Motor yacht Hessian	23
Yacht Navigator	52
Barge Randolph, Chadwick Co	1,000
Tug Neponset, barge Rahn	1,600
Steamer Bunker Hill, Eastern S. S. Co	4,779
	13,781

BOSTON.

Arrived:
- Steamer Ontario from Baltimore, Mer. & Min. T. Co..... 3,099
- Steamer Parthian from Philadelphia, Mer. & Min. T. Co..... 2,082
- Steamer Herman Winter from New York, Eastern S. S. Co..... 2,625
- Steamer Katahdin from Jacksonville, Clyde S. S. Co..... 2,696
- Steamer Chippewa from Charleston, Clyde S. S. Co..... 2,696
- Steamer H. M. Whitney from New York, Eastern S. S. Co..... 2,707
- Tug Scranton—
  - Barge Waverly, Potter S. S. Co..... 1,800
  - Barge Avondale, Potter S. S. Co..... 2,020
- Tug Security, barge S. T. Co. No. 57, Standard T. Co..... 1,000

Highland Light, wind 5 p. m., NNE., 12 miles, moderate sea, clear.

Chatham, wind NE., light breeze, clear:
- Passed east—
  - Tug Lykens—
    - Barge Pickering, Reading..... 1,175
    - Barge Pennypack, Reading..... 1,175
    - Barge Oley, Reading..... 3,000
  - Steamer Bay Port, White Oak T. Co..... 1,399
  - Tug Valley Forge—
    - Barge Cocalico, Reading..... 1,550
    - Barge Mahanoy, Reading..... 1,450
    - Barge Thomaston, Reading..... 1,025
  - Tug Lenape—
    - Barge Franklin, Reading..... 1,550
    - Barge Tohickon, Reading..... 1,175
  - Tug Essex, towing 1 barge..... 1,000
  - Tug Bristol—
    - Barge Chehaw, Chadwick Co..... 1,000
    - Barge Greenwood, Chadwick Co..... 1,500

Nobska, wind NE., 5 miles; cloudy.

Vineyard Haven, wind N., light breeze, smooth sea, clear:
- Sailed east, schooner St. Bernard (Br.)..... 137
- West—
  - Schooner Mattie J. Alles..... 229
  - Schooner Burnett C. (Br.)..... 105
- East, steamer Millinocket, A. H. Bull S. S. Co..... 3,336
- West—
  - Steamer Joancy.....
  - Schooner J. Frank Seavey..... 412
  - Tug Perth Amboy—
    - Barge No. 784, Lehigh Valley..... 900
    - Barge No. 790, Lehigh Valley..... 600
    - Barge No. 703, Lehigh Valley..... 600
- Steamed west, tug Plymouth towing 3 barges, L. & W. Coal Co..... 2,400
- East—
  - Tug International—
    - Barge Neshaminy, Reading R. R..... 1,175
    - Barge Bast, Reading R. R..... 1,025
  - Tug Covington—
    - Barge Pottsville, Seaboard T. Co..... 2,300
    - Barge Idaho, Seaboard T. Co..... 2,200
    - Barge Ohio, Seaboard T. Co..... 2,850

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	2	Tugs	11
Barges	2	Barges	25
Schooner	1	Schooners	4
Dredge	1	Tonnage, estimated	55,993
Scows	2		
Motor boats	2		
Tonnage, estimated	13,781		
Lighters	2		

JUNE 1, 1916.

Passed:
West—
Steamer Bunker Hill, Eastern S. S. Co. 4,779
Schooner George Churchman 281
Schooner J. R. Bodwell 224
Schooner Wm. D. Hilton 324
Schooner St. Croix 234
Yacht Helen M. 31
Yacht Aurelia 16
East—
Steamer Massachusetts, Eastern S. S. Co. 4,779
Tug Pow Pow, barge Summit Hill 1,000
Tug Minnie, barge Coast Transit Co. No. 5 700
12,368

BOSTON.

Arrived:
Steamer Dorchester, from Norfolk, Mer. & Min. T. Co. 2,537
Steamer Bristol, from Norfolk 284
Steamer William Chisholm, Seaboard T. Co. 1,581
Tug Catawissa—
Barge Ephrata, Reading 1,550
Barge Cacoosing, Reading 1,175
Barge Monitor, Reading 1,550
Tug Calvert—
Barge Cohocton, Chadwick Co. 1,020
Barge Pequest, Chadwick Co. 1,375
Barge Tobyhanna, Chadwick Co. 1,350
Steamed:
Steamer Absalom (Dan.), for Norfolk
Steamer Parthian, for Philadelphia, Mer. & Min. T. Co. 2,082
Steamer Bylayl, for Baltimore
Tug International—
Barge Bear Ridge, Reading 910
Barge Rutherford, Reading 955
Barge Eagle Hill, Reading 911
Steamer Suffolk, for Norfolk, Coastwise S. S. Co. 4,718
Highland Light, wind 5 p. m., SW.; 25 miles; moderate sea; clear:
Passed west, tug Valley Forge—
Barge Barry, Reading 954
Barge Kimberton, Reading 955
Barge Langhorne, Reading 955
Chatham, wind, 5 p. m., SW.; moderate; clear:
Passed, tug Boxer, F. W. Munn 216
Nobska, wind, 5 p. m., SW.; 9 miles; clear:
Passed west—
Steamer Malden, N. E. C. & C. Co. 5,107
Tug Conestoga—
Barge Temple Hill, Reading 963
Barge Cumru, Reading 1,780
Barge Henry Clay 841
Vineyard Haven, wind, a. m., E.; p. m., S.; light breeze; moderate sea; clear:
Sailed—
East—
Schooner Melissa Trask 236
Schooner Abbie Keast (Br.)
Schooner Colin C. Baker 410
Schooner Edward G. Haight 495
Schooner Jennie A. Stubbs 198
West—
Schooner Lillie B. Hirth (Br.)
Schooner Rebecca G. Whilldin 220

Vineyard Haven—Continued.
Passed—
East, steamer City of Augusta, Ocean S. S. Co..... 2,869
West—
Schooner Wm. Jones..... 302
Schooner Wm. Bisbee..... 309
East—
Tug Carlisle, towing 3 barges, Reading..... 3,000
Tug Ontario, towing 3 barges, N. Y., O. & W. R. R. Co..... 3,000
West, tug Nottingham—
Barge 2, L. & W. Coal Co..... 700
Barge 8, L. & W. Coal Co..... 700
Barge 11, L. & W. Coal Co..... 700

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	2	Tugs	9
Barges	2	Barges	24
Schooners	4	Schooners	9
Motor yachts	2	Tonnage, estimated	46,908
Tonnage, estimated	12,368		

JUNE 2, 1916.

Passed:
West—
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Schooner Irene Meservey..... 244
Schooner Emma W. Day..... 96
Tug Walter A. Luckenbach, Luckenbach S. S. Co..... 434
Tug Pallas, barge Canton, Chadwick Co..... 531
Tug Neponset, barge Mary Horan..... 700
East—
Tug Neptune, barge Katherine Howard..... 700
Steam lighter Cornelia, Boston S. & G. Co..... 285
Schooner Itasca..... 75
Steamer Bunker Hill..... 4,779
Tug John G. Chandler, barge Lottie..... 800
13,423

BOSTON.

Arrived:
Steamer Quantico, from Philadelphia, Mer. & Min. T. Co..... 2,676
Steamer Howard, from Baltimore, Mer. & Min. T. Co..... 3,581
Tug Gwalia—
Barge Providence, N. E. C. & C. Co..... 2,650
Barge Portsmouth, N. E. C. & C. Co..... 2,650
Tug Chas. T. Gallagher, barge S. T. Co. No. 5, Chadwick Co..... 700
Steamed:
Steamer Dorchester for Newport News, Mer. & Min. T. Co..... 2,537
Steamer Bristol..... 284
Tug Cuba—
Barge Tipton, Staples T. Co..... 594
Barge Chatham, Staples T. Co..... 1,812
Barge Havanna, Staples T. Co..... 1,000
Tug Wyoming—
Barge 700, Lehigh Valley..... 934
Barge 705, Lehigh Valley..... 934
Barge 781, Lehigh Valley..... 931
Highland Light, wind 5 p. m. SE.; 15 miles; clear; smooth sea:
Passed—
Steamer San Juan for New York., N. Y. & Porto Rico..... 3,503
Steamer North Land for Portland, Eastern S. S. Co..... 3,282
Chatham, wind SE.; light breeze; hazy:
Passed east, tug Cumberland—
Barge 18, Consolidation C. Co..... 1,600
Barge 17, Consolidation C. Co..... 1,600
Barge 15, Consolidation C. Co..... 1,600

Nobska, wind SE.; light breeze; clear.
Passed east, tug Gypsum King, towing 3 barges, J. B. King Co..... 2,100
Vineyard Haven, wind a. m. variable; p. m. S.; light; smooth sea; clear:
Arrived and sailed west—
Schooner T. W. Allan..... 113
Schooner Isaiah K. Stetson..... 313
Arrived and steamed—
East, tug Georges Creek, towing 2 barges, Consolidation C. Co..... 3,200
East, tug, Standard, towing 1 barge, S. T. Co..... 1,000
West, tug Western—
Barge Pilgrim, N. Y. O. & W. R. R..... 1,000
Barge Smyrna, N. Y. O. & W. R. R..... 741
Barge Sidney, N. Y. O. & W. R. R..... 745
West, tug Cheektowaga, towing 3 barges, Lehigh Valley..... 2,100

In canal:		Around cape:	
Steamers	2	Steamers	6
Tugs	5	Tugs	10
Barges	4	Barges	24
Schooners	3	Schooners	2
Steam lighter	1	Tonnage, estimated	44,180
Tonnage, estimated	13,423		

JUNE 4, 1916.

Passed:
West—
Steamer Massachusetts..... 4,779
Yacht Bluebird..... 10
Yacht Kingfisher..... 10
Yacht Halcyon..... 89
East—
Steamer Bunker Hill..... 4,779
Tug Prudence—
Barge Varina..... 700
Barge Karl..... 700
Tug Chas. T. Gallagher..... 90
Schooner Abenaki..... 176
Schooner Addie P. McFadden..... 251
Schooner Mary E. Olys..... 224
Schooner Ranger..... 9
11,818

BOSTON.

Arrived:
Steamer Kershaw, from Norfolk, Mer. & Min. T. Co..... 2,599
Motor barge S. T. Co. No. 62, Standard T. Co..... 1,000
Tug Germantown—
Barge Beeckwood, Reading..... 1,250
Barge Draper, Reading..... 1,450
Barge Phoenix, Reading..... 1,550
Tug Patience—
Barge Glendower, Reading..... 1,450
Barge Brookside, Reading..... 1,250
Barge Richardson, Reading..... 1,025
Tug Chas. W. Parker, jr.—
Barge Annie, N. E. C. & Coke Co..... 1,500
Barge Emelie, N. E. C. & Coke Co..... 1,500
Tug Plymouth—
Barge L. & W. No. 3, L. & W. Coal Co..... 1,500
Barge L. & W. No. 10, L. & W. Coal Co..... 1,500
Steamed:
Steamer City of Augusta, for Savannah, Ocean S. S. Co..... 2,869
Steamer Howard, for Norfolk, Mer. & Min. T. Co..... 3,581
Steamer Norfolk, for Norfolk, Coastwise S. S. Co..... 3,521
Steamer Katahdin, for Charleston, Clyde S. S. Co..... 2,696
Steamer William Chisholm, for Newport News, Seaboard T. Co..... 1,581
Steamer Quantico, for Philadelphia, Mer. & Min. T. Co..... 2,676

Vineyard Haven, wind SW., moderate; clear, smooth sea.

Arrived—

East—

Schooner Wesley Abbott	144
Schooner B. I. Hazard	392

West—

Tug Catawissa, towing 3 barges, Reading R. R	2,700
Tug Lykens, towing 3 barges, Reading R. R	2,700

Passed—

West, tug Gwalia—

Barge Salem, N. E. C. & Coke Co	1,200
Barge Tobyhanna	800
East, steamer Nacoochee, for Boston, Ocean S. S. Co	2,680

In canal:		Around cape:	
Steamers	2	Steamers	7
Tugs	2	Tugs	7
Barges	2	Barges	18
Yachts	3	Motor barges	1
Schooners	4	Schooners	2
Tonnage estimated	11,818	Tonnage estimated	45,114

JUNE 5, 1916.

Passed:

West—

Steamer Bunker Hill, Eastern S. S. Co	4,779
Yacht Needle	10
Yacht Nemema	10
Yacht Wild Arab	10

East—

Yacht Wishoe	10

Tug Petrel—

Barge Dunmore, Erie R. R	960
Barge Marion, Erie R. R	1,060
Barge Troy, Erie R. R	1,100

Tug Pejepscot—

Barge Nay Aug, Chadwick Co	1,375
Barge R. & R. R. Co. No. 1, Chadwick Co	1,000
Schooner Donna T. Briggs	204
Schooner George F. Carman	36
Steamer Massachusetts, Eastern S. S. Co	4,779
	15,333

BOSTON.

Arrived:

Steamer Brandon, from Baltimore, N. E. C. & Coke Co	2,431
Steamer Nantucket, from Baltimore, Mer. & Min. T. Co	2,599
Steamer Persian, from Philadelphia, Mer. & Min. T. Co	2,677
Steamer Bay View, from Newport News, White Oak T. Co	1,399
Steamer Evangeline, from New York, Evan. S. S. Co	4,360

Tug Lehigh—

Barge No. 704, Lehigh Valley	1,620
Barge No. 783, Lehigh Valley	1,625
Barge No. 788, Lehigh Valley	925

Tug Tacony—

Barge Stratford, Sus. Coal Co	1,000
Barge Devon, Sus. Coal Co	1,100
Barge Nanticoke, Sus. Coal Co	1,900

Tug Mars—

Barge Harrisburg, F. W. Munn	2,100
Barge Elk Garden, F. W. Munn	1,475
Barge Horace A. Allyn, F. W. Munn	1,300

Steamed:

Steamer Kershaw , for Baltimore, Mer. & Min. T. Co	2,599
Steamer Coastwise, for Newport News, Coast S. S. Co	4,015
Steamer Arlington, for Baltimore, N. E. C. & Coke Co	2,413
Steamer Everett, for Sewalls Point, N. E. C. & Coke Co	5,107

Steamed—Continued.
Tug Plymouth—
Barge 9, L. & W. Coal Co..... 700
Barge 1, L. & W. Coal Co..... 800
Barge 14, L. & W. Coal Co..... 800
Tug Patience—
Barge Skippack, Reading..... 739
Barge Tamanend, Reading..... 721
Barge Thomaston, Reading..... 693
Highland Light, wind 5 p. m. SW., 22 miles; clear, smooth sea:
Passed—
Steamer Herman Winter, for New York, Eastern S. S. Co..... 2,625
Passed west:
Tug Cheektowaga—
Barge 766, Lehigh Valley..... 600
Barge 740, Lehigh Valley..... 700
Barge 785, Lehigh Valley..... 700
Nobska, wind 4.50 p. m. WSW; light breeze; cloudy:
Passed steamer Bay State, for Newport News, White Oak T. Co..... 1,245
Vineyard Haven, wind SW.; fresh; choppy sea; clear:
Arrived—
Eastbound, schooner Vesta (Br.)..... 119
Westbound, schooner Laura C. Hall (Br.)..... 100
Eastbound—
Schooner Maude H. Dudley..... 392
Schooner Mary B. Wellington..... 426
Tug Eastern towing 1 barge..... 800
Tug Scranton—
Barge Hopatoong, Potter S. S. Co..... 1,375
Barge Allentown, Potter S. S. Co..... 1,200
Barge STCo. 2, Potter S. S. Co..... 800

News item: Boston, January 5.—Reading Railroad barge Exeter (capacity 3,000 tons) from Philadelphia for Bangor, in tow of tug Swatara, went ashore on West Chop, Vineyard Sound, yesterday morning. Reading tugs Lykens and Catawissa assisted the Swatara in trying to float the barge and moved her 60 feet; hope to float her at high water to-day.

In canal:		Around cape:	
Steamers	2	Steamers	11
Yachts	4	Tugs	8
Tugs	2	Barges	22
Barges	5	Schooners	4
Schooners	2	Tonnage, estimated	56,180
Tonnage, estimated	15,333		

JUNE 6, 1916.

Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Steamer Brandon, N. E. C. & Coke Co..... 2,431
Steamer Mohawk, Maine Coast Co..... 535
Tug Petrel—
Barge Hackensack, Erie R. R..... 800
Barge Hawthorne, Erie R. R..... 700
Barge Stroudsburg, Erie R. R..... 600
Barge Sharon..... 482
Schooner Vahra..... 200
Passed east:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Schooner Nat Meeder..... 278
15,584

BOSTON.

Arrived:
Steamer Ontario from Norfolk, Mer. & Min. T. Co..... 3,099
Steamer J. H. Devereux from Norfolk..... 1,618
Steamer Nacoochee, Ocean S. S. Co..... 2,680
Steamer Persian from Philadelphia, Mer. & Min. T. Co..... 2,677

Arrived—Continued.
Steamer Nantucket from Norfolk, Mer. & Min. T. Co 2,599
Steamer Chippewa from Jacksonville, Clyde S. S. Co 2,696
Steamer Middlesex from Norfolk, Coastwise T. Co 2,727
Steamer Bay Port from Norfolk, White Oak T. Co 1,399
Highland Light, wind 5 p. m., SE ; 5 miles; clear; smooth sea:
Passed west—
Steamer Geo. E Warren, Bos. Vir. T. Co 2,306
Steamer Montara, Pac. Coast S. S. Co 2,562
Tug Germantown—
Barge Cocalico, Reading R. R 956
Barge Glendower, Reading R. R 855
Barge Manheim, Reading R. R 955
Motor Barge No. 62, Standard T. Co 800
Chatham, wind SE.; light breeze; clear:
Passed east tug Swatara—
Barge Wiconisco, Reading R. R 1,550
Barge Exeter, Reading R. R 3,000
Barge Yardley, Reading R. R 1,550
News item: Barge Exeter, which went ashore at West Chop, Vineyard Sound, floated at 2 a. m., June 6, and proceeded at 6 a. m.
Passed west, tug Mercury—
Barge Musconetcong, Chadwick Co 800
Barge Chenango, Chadwick Co 700
Barge Easton, Chadwick Co 600
Vineyard Haven, wind variable; light; smooth sea; clear:
Steamed east, Tug Tamaqua—
Barge Robesonia, Reading 1,550
Barge Enterprise, Reading 1,550
Barge Ontelaunce, Reading 1,175
Passed west, Schooner Sannie P. Chase 256
Steamed west, Tug S. O. No. 2, towing 2 barges, Standard T. Co 1,600

In canal:		Around cape:	
Steamers	4	Steamers	10
Tugs	1	Tugs	5
Barges	4	Barges	14
Schooners	2	Motor barge	1
Tonnage, estimated	15,584	Schooners	1
		Tonnage, estimated	42,260

JUNE 8, 1916.

Passed west:
Steamer Massachusetts, Eastern S. S. Co 4,779
Schooner Little Fannie 23
Passed east:
Barge Ida Woods 800
Steamer Bunker Hill, Eastern S. S. Co 4,779

10,381

BOSTON.

Arrived:
Steamer Howard from Norfolk, M. & M. Trans 3,581
Steamer Bylayl from Norfolk ..... ?
Steamer City of Atlanta from Savannah, Ocean S. S. Co 5,433
Steamed:
Steamer Baymore for New York .....
Steamer Parthian for Philadelphia, M. & M. Trans 2,082
Steamer Gloucester for Norfolk, M. & M. Trans 2,541
Highland Light, wind NE., 25 miles; foggy; moderate sea.
Passed Steamer Malden for Newport News.
Nobska, wind E., 17 miles; cloudy.
Passed west—
Tug Cumberland—
Barge 17, Con. Coal Co 935
Barge 19, Con. Coal Co 932
Barge 23, Con. Coal Co 900

Nobska—Continued.
Passed west—Continued.
Tug Eureka—
Barge Randolph, Staples..... 567
Barge Mount Hope, Staples..... 1,801
Barge Braddock, Staples..... 678
Vineyard Haven:
Arrived, eastbound—
Tug Piedmont—
Barge 10, Con. Coal Co..... 1,500
Barge 21, Con. Coal Co..... 1,600
Barge 24, Con. Coal Co..... 2,800
Tug Perth Amboy—
Barge 790, L. V. R. R..... 900
Barge 791, L. V. R. R..... 900
Barge 793, L. V. R. R..... 830
Tug Security—
Barge 57, Standard T. Co..... 1,000
Barge 123, Standard T. Co..... 1,000
Passed west—
Schooner McClure (Br.)..... 220
Tug Gypsum King, 2 barges, J. B. King Co..... 2,000
Tug Mercury, 3 barges, Boston Tow Boat Co..... 2,400
Tug Bristol, 3 barges, L. C. & N. Co..... 2,100
Tug George Creek—
Barge 5, Con. Coal Co..... 909
Barge 15, Con. Coal Co..... 912
Barge 20, Con. Coal Co..... 932

39,453

In canal:		Around cape:	
Steamers	2	Steamers	7
Schooners	1	Tugs	9
Barges	1	Barges	25
Tonnage, estimated	10,381	Schooners	1
		Tonnage, estimated	39,453

JUNE 9, 1916.

Passed west:
Steamship Bunker Hill, Eastern Steamship Co..... 4,779
Schooner Edith McIntyre..... 160
Steamship Massachusetts, Eastern Steamship Co..... 4,779

9,718

BOSTON.

Arrived: Steamer Quantico, from Philadelphia, M. & M. T. Co..... 2,676
Steamed:
Steamship Howard, for Baltimore, M. & M. T. Co..... 3,581
Steamship Suffolk, for Norfolk, Coastwise Steamship Co..... 4,718
Highland Light, 5 p. m. wind E.; 26 miles; thick fog; rough sea.
Nobska, wind E., 25 miles; fog and rain:
Passed, steamship Huron for Boston, Clyde Steamship Co..... 3,318

14,293

In canal:
Steamers..... 2
Schooners..... 1
Tonnage, estimated..... 9,718
Around cape:
Steamers..... 4
Tonnage, estimated..... 14,293

JUNE 11, 1916.

Passed:
- East, steamer Massachusetts, Eastern S. S. Co 4,779
- West—
  - Steamer Bunker Hill, Eastern S. S. Co 4,779
  - Tug Prudence—
    - Barge Karl, F. W. Munn 408
    - Barge Varina, F. W. Munn 441
  - East—
    - Tug J. C. Chandler, barge Ruth, F. W. Munn 900
    - Tug Neponset—
      - Barge K. Horan, Jas. Hughes 900
      - Barge Rose M. Feeney, Jas. Hughes 900

13,107

BOSTON.

Arrived:
- Tug S. T. Co., No. 2—
  - Barge S. T. Co. No. 57, Standard Towing Co 1,000
  - Barge S. T. Co. No. 123, Standard Towing Co 1,000
- Steamer Nantucket from Norfolk, Mer. & Min. T. Co 2,599
- Steamer Montara, from Newport News, Pacific Coast S. S. Co 2,562
- Steamer City of Atlanta, from Savannah, Ocean S. S. Co 5,433

Steamed:
- Steamer Lexington, from Providence, Mer. & Miners T. Co 2,092
- Tug Prudence—
  - Barge Reading, F. W. Munn 1,200
  - Barge Elk Gordon, F. W. Munn 800
- Tug Tacony—
  - Barge Strafford, Sus. Coal Co 678
  - Barge Oxford, Sus. Coal Co 836
  - Barge Malverne, Sus, Coal Co 844
- Tug Ontario—
  - Barge Liberty, N. Y. O. & W 856
  - Barge Ellenville, N. Y. O. & W 858
  - Barge Cadosia, N. Y. O. & W 756
- Tug Eastern, barge Eugenia 800

Vineyard Haven, wind E.; light; smooth sea; rain:
- Arrived, east, schooner Ann J. Trainor 426
- Steamed, east, tug North American, towing 2 barges, Texas S. S. Co 2,000

24,740

In canal:		Around cape:	
Steamers	2	Steamers	4
Tugs	3	Tugs	6
Barges	5	Barges	13
Tonnage, estimated	13,107	Schooners	1
		Tonnage, estimated	24,740

JUNE 12, 1916.

Passed west:
- Steam lighter Cornelia, Boston Sand & G. Co 285
- Barge Hatteras, So. Trans. Co 700
- Steamer Massachusetts, Eastern S. S. Co 4,779
- Schooner Annie Gus 99

Passed east:
- Steamer Bunker Hill 4,779
- Tug Petrel, towing 3 barges, Erie R. R 3,000
- Tug Cheektowaga, towing 3 barges, Lehigh Valley 3,000

16,642

BOSTON.

Arrived:
- Steamer City of Columbus, from Savannah, Ocean S. S. Co 5,433
- Steamer Persian, from Philadelphia, Mer. & Min. T. Co 2,677
- Steamer Juniata, from Baltimore, Mer. & Min. T. Co 3,465
- Steamer Arlington, from Baltimore, N. E. C. & Coke Co 2,431
- Steamer Bay State, from Newport News, White Oak T. Co 1,245
- Steamer J. H. Devereux 1,618

Arrived—Continued.
Tug Perth Amboy—
Barge 793, Lehigh Valley..... 830
Barge 790, Lehigh Valley..... 900
Tug Piedmont—
Barge 10, Con. Coal Co..... 1,500
Barge 21, Con. Coal Co..... 1,600
Barge 24, Con. Coal Co..... 2,800
Steamed:
Steamer Tunisie (Belg.) for New York.....
Tug Carlisle—
Barge Bast, Reading R. R..... 693
Barge Monitor, Reading R. R..... 955
Barge Richardson, Reading R. R..... 693
Steamer Moldgaard (Nor.) for Philadelphia..... 2,735
Steamer Nantucket for Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Cubadist for New York.....
Highland Light, wind SW., moderate, part cloudy, smooth sea:
Steamed: Tug Richmond—
Barge Idaho, Seaboard T. Co..... 1,376
Barge Pottsville, Seaboard T. Co..... 1,283
Nobska, 5 p. m., wind SW., 9 miles, light fog:
Passed west—
Tug Tamaqua—
Barge Molino, Reading R. R..... 954
Barge Pennypack, Reading R. R..... 739
Barge Pickering, Reading R. R..... 739
Tug Swatara—
Barge Marion, Reading R. R..... 954
Barge Paxinos, Reading R. R..... 954
Barge Tohickon, Reading R. R..... 739
Vineyard Haven, wind SW., moderate, foggy, smooth sea:
Arrived west, schooner W. R. Perkins..... 178
Steamed east—
Tug Lenape—
Barge Kimberton, Reading R. R..... 1,550
Barge Moselem, Reading R. R..... 1,550
Barge Langhorne, Reading R. R..... 1,550
Tug Honeybrook, towing 3 barges, L. & W. Coal Co..... 3,000
Tug S. O. No. 2, towing 2 barges, Standard T. Co..... 2,000
Tug Chas. P. Greenough, towing 2 barges, Com. T. B. Co..... 2,000
Tug Wyoming, towing 3 barges, Lehigh Valley..... 3,000
Passed east—
Steamer Bay View, White Oak T. Co..... 1,399
Steamer Joancy.....
Schooner Vesta (Br.)..... 119

In canal:		Around cape:	
Steamers	2	Steamers	12
Steam lighter	1	Tugs	11
Tugs	2	Barges	29
Barges	7	Schooners	2
Schooner	1	Tonnage estimated	56,258
Tonnage estimated	16,642		

JUNE 13, 1916.

Passed east:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Tug Mercury, towing 3 barges, Boston T. B. Co..... 3,000
Tug Albatross, P. Dougherty..... 286
Passed west:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Tug Neponset, barge S. A. Johnson..... 800
Arrived Wings Neck:
Tug Watuppo, towing 4 barges, Staples T. Co..... 2,800
Tug Atkins, barge Junior, Coal for Canal Co..... 728
728

Total..... 17,172

BOSTON.

Arrived:
- Steamer Gloucester, from Norfolk, Mer. & Min. T. Co 2,541
- Steamer Bay Port, from Newport News, White Oak T. Co 1,399
- Steamer Bilbster (Br.) 4,478
- Tug International—
  - Barge Rutherford, Reading R. R 1,550
  - Barge Pocopson, Reading R. R 1,175
  - Barge Suffolk, Reading R. R 1,450
- Tug Valley Forge—
  - Barge Bethayres, Reading R. R 1,550
  - Barge Hammond, Reading R. R 1,025

Steamed:
- Steamer Hilarius (Br.) for New York 3,147
- Steamer Arlington for Baltimore, N. E. C. & Coke Co 2,431
- Steamer Zaandike (Dutch) for Baltimore 4,006
- Steamer Herman Winter for New York, Eastern S. S. Co 2,625
- Steamer City of Columbus for Savannah, Ocean S. S. Co 5,433
- Steamer Moutara for Newport News, Pacific Coast 2,562

Highland Light, 5 p. m., wind E.; 7 miles; thick fog; smooth sea.
Chatham, 5 p. m., wind NE.; light breeze; thick fog.
- Passed west, tug Piedmont—
  - Barge 7, Consolidation 898
  - Barge 18, Consolidation 935
  - Barge 8, Consolida'ion 924

Nobska, 5.15 p. m., wind N.; 2 miles; cloudy.
Vineyard Haven:
- Arrived eastbound—
  - Tug Thos. J. Scully, towing 2 barges, Luck S. S. Co 3,000
  - Tug Gwalia, towing 3 barges, N. E. C. & C. Co 2,400
  - Tug Murrell, towing 3 barges, N. E. C. & C. Co 2,400
  - Tug Boswell, towing 3 barges 3,000
  - Tug Cuba, towing 3 barges, Staples T. Co 2,400
  - Tug Paoli, towing 3 barges, Sus. Coal Co 3,000
  - Tug A. J. Stone, towing 3 barges, Erie R. R 3,000
  - Tug Calvert, towing 3 barges, P. Dougherty 3,000
  - Tug Fred E. Richards, towing 2 barges, R. & R. L. Co 2,000
  - Tug Boxer, towing 2 barges, F. W. Munn 2,000
  - Tug Catawissa—
    - Barge Cumru, Reading 3,000
    - Barge Temple, Reading 1,550
    - Barge Bear Ridge, Reading 1,550
  - Tug Lykens—
    - Barge Oak Hill, Reading 1,550
    - Barge Conewago, Reading 1,550
    - Barge Franklin, Reading 1,550
  - Tug Germantown, towing 3 barges, Reading 3,000

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	5	Tugs	16
Barges	9	Barges	44
Tonnage estimated	17,172	Tonnage estimated	78,079

JUNE 14, 1916.

Passed west:
- Steamer Massachusetts, Eastern S. S. Co 4,779
- Steamer General Lincoln, B. N. & P. S. B. Co 398
- Schooner Mary Ann McCann 178
- Schooner Alaska 173
- Schooner James Young 261
- Schooner John R. Penrose 455
- Schooner Thos. H. Lawrence 374
- Schooner Rob Roy 785
- Schooner Mary F. Smith 8
- Tug Juno, barge Catherine Howard 583
- Tug Petrel, towing 3 barges, Erie 2,400

Passed west—Continued.
Tug Wm. H. Yerkes—
Barge Rahn, L. Coal & Nav. Co..... 932
Barge Tamaqua, L. Coal & Nav. Co..... 830
Barge Lansford, L. Coal & Nav. Co..... 830
Barge Canton, Staples T. Co..... 531
Passed east:
Tug June, dredge Nahant, Eastern D. Co..... 200
Barge, Kennedy Bros..... 300
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
18,796

BOSTON.

Arrived:
Steamer Parthian from Philadelphia, Mer. & Min. T. Co..... 2,082
Steamer Kershaw from Baltimore, Mer. & Min. T. Co..... 2,599
Steamer H. M. Whitney from New York, Eastern S. S. Co..... 2,706
Tug Gettysburg—
Barge Barry, Reading R. R..... 1,550
Barge Leesport, Reading R. R..... 1,550
Tug Perth Amboy—
Barge No. 705, Lehigh Valley..... 1,620
Barge No. 795, Lehigh Valley..... 750
Barge No. 700, Lehigh Valley..... 1,620
Tug Toltec, barge Detroit..... 700
Tug Mercury—
Barge Pocono, Chadwick Co..... 1,100
Barge S. T. Co. No. 2, Chadwick Co..... 700
Barge R. & R. L. Co. No. 6, Chadwick Co..... 700
Tug S. T. Co. No. 2—
Barge No. 5, Standard T. Co..... 1,000
Barge No. 124, Standard T. Co..... 1,000
Steamed:
Steamer Tula (Dan) for New York..... 442
Steamer Kenmore (Br.) for Baltimore..... 118
Steamer Juniata for Norfolk, Mer. & Min. T. Co..... 3,465
Steamer Gloucester for Norfolk, Mer. & Min. T. Co..... 2,541
Tug Gettysburg—
Barge Beechwood, Reading R. R..... 841
Barge Draper, Reading R. R..... 855
Barge Phoenix, Reading R. R..... 901
Tug Lehigh—
Barge No. 793, Lehigh Valley..... 934
Barge No. 782, Lehigh Valley..... 924
Barge No. 765, Lehigh Valley..... 600
Highland Light, wind 5 p. m., E.; 18 miles; dense fog; smooth sea.
Chatham, wind 5 p. m., NE.; light breeze; dense fog.
Nobska, wind 5 p. m., ENE.; 7 miles; fair:
Passed: Steamer H. F. Dimock for Portland, Eastern S. S. Co..... 2,625
Passed east:
Tug Western towing barges, N. Y. O. & W. R. R..... 3,000
Tug Resolute, barge Wilmington, P. Dougherty..... 300
Tug Mars—
Barge Mahanoy, Reading R. R..... 1,450
Barge Tamanend, Reading R. R..... 1,175
Barge Silver Brook, Reading R. R..... 1,550
Passed: Steamer Persian for Philadelphia, Mer. & Min. T. Co..... 2,677
Passed west:
Tug Valley Forge—
Barge Ontelaunce, Reading R. R..... 739
Barge Maple Hill, Reading R. R..... 911
Calls at New Bedford for barge Buck Ridge.....

Vineyard Haven, wind N.; moderate; foggy; smooth sea:
Steamed east—
Tug Plymouth towing 3 barges, L. & W. Coal Co..... 3,000
Steamer Katahdin, Clyde S. S. Co..... 2,696
Schooner Rosalie (Br.).....
Tug Ontario towing 3 barges, N. Y. O. & W. R. R. Co..... 3,000
Tug Wyoming towing 3 barges, Lehigh Valley..... 3,000

In canal:		Around cape:	
Steamers	3	Steamers	9
Tugs	4	Tugs	14
Barges	9	Barges	35
Dredge	1	Schooners	1
Schooners	7	Tonnage estimated	57,421
Tonnage estimated	18,796		

JUNE 15, 1916.

Passed east: Steamer Massachusetts, Eastern S. S. Co..... 4,779
Passed west:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Steamer J. H. Devereux, Metro. Coal Co..... 1,618
Tug Albatross, barge Hy. Endicott, Poco. Fuel Co..... 866
12,042

BOSTON.

Arrived:
Steamer Dorchester from Baltimore, Mer. & Min. T. Co..... 2,537
Steamer Nassau from New York, L. I. R. R..... 400
Tug Essex, barge N. T. Co. No. 2, 1 other.
Steamed:
Steamer Pathfinder for Philadelphia, N. Y. & P. Rico S. S. Co..... 2,792
Steamer Kershaw for Norfolk, Mer. & Min. T. Co..... 2,599
Tug International—
Barge Bethayres, Reading..... 955
Barge Eagle Hill, Reading..... 911
Barge Lincoln, Reading..... 855
Highland Light, wind noon, E., 10 miles; foggy; smooth sea:
Passed:
Steamer Onondaga for Charleston, Clyde S. S. Co..... 2,696
Tug Security—
Barge No. 57 for New York, Standard T. Co..... 700
Barge No. 123 for New York, Standard T. Co..... 700
Tug Monocacy from Philadelphia—
Barge Spring, Reading..... 3,000
Barge Cocalico, Reading..... 1,550
Barge Thomaston, Reading..... 1,025
Chatham, wind E.; light; cloudy:
Passed, tug Savage from Baltimore—
Barge No. 14, Consolidation..... 927
Barge No. 25, Consolidation..... 1,566
Nobska:
Passed, steamer Bylayl from Norfolk.
Vineyard Haven, wind NE.; fresh breeze; cloudy; choppy sea:
Arrived eastbound—
Schooner Saml. B. Hubbard..... 403
Schooner Nellie J. King (Br.).

In canal:		Around Cape:	
Steamers	3	Steamers	6
Tug	1	Tugs	5
Barge	1	Barges	12
		Schooners	2
Tonnage, estimated	12,000	Tonnage, estimated	23,616

JUNE 16, 1916.

Passed west:
- Steamer Massachusetts, East. S. S. Co 4,779
- Schooner Roger Drury 360
- Schooner Chas. H. Trickey 281
- Lighter Reliance, Boston Sand & Granite Co 251

Passed east:
- Steamer Bunker Hill, East S. S. Co 4,779
- Tug Walter A. Luckenbach 423

10,873

BOSTON.

Arrived:
- Steamer Goodwood (Br.) from Savannah 3,086
- Steamer Nacoochee from Savannah, Ocean S. S. Co 2,680
- Steamer Quantico from Philadelphia, Pa., Mer. & Miners T. Co 2,676
- Steamer Ontario from Norfolk, Mer. & Miners T. Co 3,099
- Tug Tamaqua—
  - Barge Skippack, Reading R. R 1,175
  - Barge Glendower, Reading R. R 1,450
  - Barge Henry Clay, Reading R. R 1,150

Steamed:
- Steamer Dorchester for Norfolk, Mer. & Miners T. Co 2,537
- Steamer Berwind for New York, N. Y. & Porto Rico S. S. Co 2,589
- Steamer Joancy for Norfolk .....

Highland Light, wind, noon SW., 15 m.; partly cloudy, smooth sea:
- Passed west, steamer Ruth, A. H. Bull S. S. Co 3,102

Chatham, wind noon, SE., moderate breeze; cloudy and hazy:
- Passed east, steamer Herman Winter, East. S. S. Co 2,625

Vineyard Haven, wind E., moderate; choppy sea; cloudy:
- Arrived—
  - East—
    - Schooner Julia Frances 183
    - Schooner William Booth 545
    - Tug Sea King—
      - Barge Bessie, McWilliams 700
      - Barge Burabik, McWilliams 800
  - West—
    - Schooner Chas. I. Jeffreys 348
    - Schooner Wanola (Br.) 314

29,059

In Canal:		Around Cape:	
Steamers	2	Steamers	9
Tug	1	Tug	1
Lighter	1	Barges	5
Schooners	2	Schooners	4
Tonnage, estimated	1,083	Tonnage, estimated	29,059

JUNE 18, 1916.

Passed west:
- Steamer Massachusetts, Eastern S. S. Co 4,779
- U. S. S. Dupont, torpedo boat, U. S. Government 165
- Tug A. J. Stone—
  - Barge Binghamton, Erie 700
  - Barge Stroudsburg, Erie 800
  - Barge Pittston, Erie 800
- Tug S. T. Co. No. 2, towing 2 barges, Standard T. Co 1,600

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Steamer Mohawk, Maine Coast S. S. Co 800

14,423

BOSTON.

Arrived:
- Steamer Juniata from Norfolk, Mer. & Min. T. Co 3,465
- Steamer Persian from Philadelphia, Mer. & Min. T. Co 2,677

Steamed:
- Steamer Nacoochee for Savannah, Ocean S. S. Co..... 2,680
- Steamer Huron for Charleston, Clyde S. S. Co..... 3,318
- Steamer Katahdin for Jacksonville, Clyde S. S. Co..... 2,696
- Steamer Ontario for Norfolk, Mer. & Min. T. Co..... 3,099
- Steamer Bay View for Norfolk, White Oak T. Co..... 1,399
- Tug Boswell—
  - Barge Nanticoke, P. Dougherty..... 1,200
  - Barge Annie, P. Dougherty..... 1,098
- Tug Boxer—
  - Barge Horace A. Allyn, F. W. Munn..... 859
  - Barge Harrisburg, F. W. Munn..... 1,200
- Tug Mars—
  - Barge Rutherford, Reading R. R..... 955
  - Barge Merriam, Reading R. R..... 855
  - Barge Tabor, Reading R. R..... 963
- Tug Cuba, barge Gibson, Staples T. Co..... 900
- Tug Gwalia—
  - Barge Harvard, N. E. C. & Coke Co..... 1,603
  - Barge Emelie, N. E. C. & Coke Co..... 1,069

Vineyard Haven, wind W., moderate; smooth sea; a. m. foggy; p. m. clear:
- Sailed east—
  - Schooner Methebesec..... 376
  - Schooner J. Howell Leeds..... 414
  - Schooner Abbie C. Stubbs..... 345
- Passed east, steamer H. F. Dimock, Eastern S. S. Co..... 2,625
- Steamed east, tug Chas. W. Parker, jr., towing 3 barges, Com. T. B. Co.. 2,400
- Sailed east, schooner Percy B. (Br.).....

In canal:		Around cape:	
Steamers.....	3	Steamers.....	8
United States torpedo boat.	1	Tugs.....	5
Tugs.....	2	Barges.....	13
Barges.....	5	Schooners.....	4
Tonnage, estimated.....	14,423	Tonnage, estimated.....	36,196

JUNE 19, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co..... 4,779
- Steam lighter Cornelia, Boston S. & G. Co..... 285
- Steam lighter Reliance, Boston S. & G. Co..... 251
- Steam lighter Palmer, Boston S. & G. Co..... 124
- Tug Petrel—
  - Barge Albany, Erie R. R..... 1,120
  - Barge Hackensack, Erie R. R..... 1,550
  - Barge Hawthorne, Erie R. R..... 1,140
- Barge Coast Transit Co. No. 5, Coast Transit Co..... 700

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co..... 4,779
- Barge Lottie..... 425
- Schooner Fannie & Fay..... 233

15,386

BOSTON.

Arrived:
- Steamer City of Atlanta from Savannah, Ocean S. S. Co..... 5,433
- Steamer Howard from Norfolk, Mer. & Min. T. Co..... 3,581
- Steamer Bay State from Norfolk, White Oak T. Co..... 1,245
- Tug Patience—
  - Barge Larimer, F. W. Munn..... 1,000
  - Barge Penn, F. W. Munn..... 3,400
- Tug Tacony—
  - Barge Oxford, Sus. Coal Co..... 1,200
  - Barge Malvern, Sus. Coal Co..... 1,200
  - Barge Stratford, Sus. Coal Co..... 1,000

Steamed:
Tug Catawissa—
Barge Barry, Reading R. R. 954
Barge Pickering, Reading R. R. 739
Barge Neshaminy, Reading R. R. 721
Steamer Santurce for Philadelphia, N. Y. & Porto Rico S. S. Co. 1,836
Steamer Quantico for Philadelphia, Mer. & Min. T. Co. 2,676
Highland Light, wind SW., 24 miles; foggy; smooth sea:
Passed west—
Steamer Black Rock 1,997
Steamer Northland, Eastern S. S. Co. 3,282
Tug Savage—
Barge No. 10, Consolidation C. Co. 897
Barge No. 24, Consolidation C. Co. 1,566
Chatham, wind, 5 p. m., S., fresh breeze; cloudy and foggy:
Passed west, tug Honeybrook—
Barge No. 3, L. & W. Coal Co. 800
Barge No. 7, L. & W. Coal Co. 700
Barge No. 10, L. & W. Coal Co. 800
Vineyard Haven, wind S., moderate; foggy; smooth sea:
Arrived—
Eastbound—
Schooner Palmetto .....
Tug Tamaqua—
Barge Skippack, Reading R. R. 1,175
Barge Glen Dower, Reading R. R. 1,450
Barge Henry Clay, Reading R. R. 1,150
Tug Swatara—
Barge Manheim, Reading R. R. 1,550
Barge Ephrata, Reading R. R. 1,550
Barge Cacoosing, Reading R. R. Co. 1,175
West, tug Georges Creek, towing 3 barges, Consolidation 2,700

In canal:		Around cape:	
Steamers	2	Steamers	7
Tugs	1	Tugs	8
Barges	5	Barges	22
Steam lighters	3	Schooners	1
Schooners	1	Tonnage, estimated	45,777
Tonnage, estimated	15,386		

JUNE 20, 1916.

Passed west:
Steamer Massachusetts, Eastern S. S. Co. 4,779
Schooner Jesse Hart, 2d, Eastern S. S. Co. 255
Passed east:
Steamer Bunker Hill, Eastern S. S. Co. 4,779
Tug Lehigh, towing 3 barges, Lehigh Valley R. R. 3,000
Tug Juniata, towing 3 barges 3,000
Tug Juno, towing dredge Nahant 200
16,013

BOSTON.

Arrived:
Steamer Arlington from Baltimore, N. E. C. & Coke Co. 2,431
Steamer J. H. Deveraux from Norfolk, Met. Coal Co. 1,618
Tug Nottingham—
Barge No. 8, L. & W. Coal Co. 1,500
Barge No. 9, L. & W. Coal Co. 1,100
Barge No. 11, L. & W. Coal Co. 1,500
Tug Conestoga—
Barge Brookside, Reading R. R. 1,250
Barge Mingo, Reading R. R. 1,550
Barge Pennypack, Reading R. R. 1,175
Tug Eureka—
Barge Cardinas, Staples Trans. Co. 2,900
Barge Foster, Staples Trans. Co. 1,530
Barge Mount Hope, Staples Trans. Co. 3,350

Steamed:
- Steamer Juniata for Baltimore, Mer. & Min. T. Co 3,465
- Steamer Howard for Norfolk, Mer. & Min. T. Co 3,581
- Steamer Bacchus for New York (Dutch) .....
- Steamer H. M. Whitney for New York, Eastern S. S. Co 2,706
- Tug Underwriter—
  - Barge Chebau, J. R. Gilman 944
  - Barge Hercules, W. R. Hagan 755
- Tug Sea King—
  - Barge Irene, N. E. C. & Coke Co 1,206
  - Barge Beattie, N. E. C. & Coke Co 1,117
- Tug Paoli—
  - Barge Nanticoke, P. Dougherty 1,000
  - Barge Radnor, P. Dougherty 800

Highland Light, wind, 5 p. m., W., 25 miles; hazy; smooth sea:
- Passed west, steamer Bay View, White Oak Trans. Co 1,399

Chatham, wind, 5 p. m., SW.; fresh breeze; clear:
- Passed west, tug Murrell, barge J. H Winstead, N. E. Coal & Coke Co .. 800
- Passed east, tug Cumberland—
  - Barge No. 5, Consolidation Coal Co 1,600
  - Barge No. 17, Consolidation Coal Co 1,600
  - Barge No. 20, Consolidation Coal Co 1,600
- Passed west, tug Monocacy—
  - Barge Indian Ridge, Reading R. R 910
  - Barge Exeter, Reading R. R 1,780
  - Barge Paxtang, Reading R. R 954
- Passed east, tug Valley Forge—
  - Barge Tohicton, Reading R. R 1,175
  - Barge Enterprise, Reading R. R 1,550
  - Barge Paxinos, Reading R. R 1,550

Nobska, wind WNW., 7 miles; clear:
- Passed west, tug Lykens—
  - Barge Kimberton, Reading R. R 955
  - Barge Temple, Reading R. R 963
  - Barge Hammond 693

Vineyard Haven, wind SW.; fresh choppy sea; clear:
- Steamed west, steamer St. Paul .....
- Arrived east—
  - Schooner O. H. Brown 1,051
  - Schooner Ravola (Br.) 147
- Passed east—
  - Schooner Eliza A. Scribner (Br.) 398
  - Schooner Margaret B. Roper 414
  - Schooner Rebecca G. Whillden 220
  - Tug Tuton, towing 2 barges 1,600
  - Tug Standard, towing 2 barges, Standard T. Co 2,000
  - Schooner Alberta 77

58,914

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	3	Tugs	13
Barges	6	Barges	32
Schooners	1	Schooners	6
Dredges	1	Tonnage, estimated	58,914
Tonnage, estimated	16,013		

JUNE 21.

Passed west:
- Steamship Bunker Hill, Eastern S. S. Co 4,779
- Tug Petrel, 3 barges, Erie R. R 2,100
- Tug Lehigh, 3 barges, L. V. R. R 2,700
- Barge R. & R. Co. No. 6, Chadwick 1,120
- Barge Pocono, Chadwick 698
- Barge Rahn, L. C. & N. Co 932
- Barge Tamaqua, L. C. & N. Co 830
- Barge Panther Creek, L. C. & N. Co 739
- Barge Salem, Shawmut S. S. Co 1,600
- Schooner Calvin P. Harris 465

Passed:
- Steamship Massachusetts, Eastern S. S. Co. 4,779
- Tug Richard F. Young, 3 barges 3,000
- Tug May, 2 barges, Pettinos Bros. 1,300
- Tug Prudence, 2 barges, Pettinos Bros. 1,300
- Schooner John Bracewell 224
- Schooner James Rothwell 498

27,064

BOSTON.

Arrived:
- Schooner Susan N. Pickering 336
- Steamship Nantucket from Baltimore, M. & M. 2,599

Cleared, bark Luigia (Ital.) for Philadelphia 917

Steamed:
- Steamship Persian for Philadelphia, M. & M. 2,677
- Steamship Bay State for Newport News, White Oak Trans. 1,245

Highland Light, 5 p. m., wind sw., 25 miles, smooth sea, cloudy and threatening rain:

Passed eastbound—
- Tug Carlisle, 2 barges, Reading R. R. 2,200
- Tug Gettysburg, 3 barges, Reading R. R. 3,300

Chatham, 5 p. m., wind sw., fresh breeze, cloudy:

Passed west—
- Tug Tamaqua, 3 barges, Reading 2,700
- Steamship City of Atlanta for Savannah, Ocean S. S. Co. 5,433
- Tug Resolute, 1 barge, P. Dougherty 600

Vineyard Haven, wind westerly, moderate, smooth sea, clear:

Arrived and sailed—
- Schooner F. C. Pendleton 408
- Schooner Lillian 129

Arrived—
- Schooner Telumah 230
- Schooner Eva A. Danenhower 228
- Schooner Vineyard 215
- Schooner Ernst T. Lee 173
- Steamship Seabury—
  - Barge Richard 134
  - Barge Raymond 184
- Tug Nemasket, barge I. F. Chapman 2,146
- Steamship Northland, Eastern S. S. Co. 3,282
- Schooner Jost 346
- Schooner Samuel Castner, jr. 239
- Schooner T. W. Allan 113

29,834

In canal:		Around cape:	
Steamers	2	Bark	1
Tugs	5	Steamers	6
Barges	19	Tugs	5
Schooners	3	Barges	12
Estimated tonnage	27,064	Schooners	10
		Estimated tonnage	29,834

JUNE 22, 1916.

Passed east:
- U. S. Destroyer Wadsworth, U. S. Govt. 1,060
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Steam lighter Cornelia, Boston S. & G. Co. 285
- Schooner Maggie Todd 136
- Schooner Henrietta Simmons 228
- Schooner Northern Light 139
- Schooner Moonlight 198
- Schooner Emma W. Day 96
- Schooner Saml. Hart 2d 210
- Schooner Sally W. Ponder 107

Passed west:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Steamer J. H. Devereux, Meto. Coal Co. 1,618
- Schooner Priscilla 16
- Steam lighter Wm. H. Moody, lighter No. 1, Rockport G. Co. 259
- Tug Juniata, barge Musconetcong, Chadwick Co. 800
- Tug Pejepscot—
  - Barge S. T. Co. No. 1, Chadwick Co. 800
  - Barge Plymouth 700

16,210

BOSTON.

Arrived:
- Steamer Ontario from Norfolk, Mer. & Min. T. Co. 3,099
- Steamer William Chisholm, Seaboard T. Co. 2,500
- Tug Triton, barge Occidental, Seaboard T. Co. 2,450
- Steamer Edison Light from Newport News, Va. T. Co. 2,549
- Tug Chas. P. Greenough—
  - Barge Annie, N. E. C. & C. Co. 1,600
  - Barge Boston, N. E. C. & C. Co. 2,650
  - Barge Clara, N. E. C. & C. Co. 1,450
- Tug May—
  - Barge Calvin, Chas. Gring. 700
  - Barge Elizabeth, Chas. Gring. 700
- Tug Prudence—
  - Barge Karl, F. W. Munn. 700
  - Barge Varina, F. W. Munn. 700
- Tug Security, barge No. 86, Standard T. Co. 1,000
- Steamer City of Columbus from Savannah, Ocean S. S. Co. 5,433
- Steamer Bendu (Br.) from Baltimore 4,319

Steamed:
- Steamer Middlesex for Norfolk, Coastwise S. S. Co. 4,727
- Steamer Nantucket for Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Parthian for Philadelphia, Mer. & Min. T. Co. 2,082

Highland Light, wind, 5 p. m., nw., 25 miles, clear, smooth sea.

Chatham, 5 p. m., wind nnw., moderate breeze,c lear:
- Passed west—
  - Tug Wyoming—
    - Barge No. 701, Lehigh Valley R. R. 934
    - Barge No. 707, Lehigh Valley R. R. 934
    - Barge No. 781, Lehigh Valley R. R. 931
  - Tug Fred E. Richards—
    - Barge R. & R. L. Co. No. 1, R. & R. Lime Co. 1,000
    - Barge R. & R. L. Co, No. 4, R. & R. Lime Co 1,000
    - Barge R. & R. L. Co. No. 5, R. & R. Lime Co. 1,000

Nobska:
- Passed west—
  - Tug Calvert—
    - Barge Tunkhannock, Chadwick Co. 700
    - Barge Cohocton, Chadwick Co. 700
  - Tug Plymouth—
    - Barge L. & W. C. Co. No. 2, L. & W. Coal Co. 800
    - Barge L. & W. C. Co. No. 4, L. & W. Coal Co. 700
    - Barge L. & W. C. Co. No. 12, L. & W. Coal Co. 800
- Passed east, steamer Ruth.

Vineyard Haven, wind NW., fresh; choppy sea; clear:
- Passed east—
  - Schooner Allanwilde 477
  - Schooner R. Bowers 435
  - Schooner Moama (Br.) 404
  - Schooner St. Bernard (Br.) 137
  - Tug Perth Amboy, towing 3 barges, Lehigh Valley R. R. 3,200
  - Tug A. J. Stone, towing 3 barges, Erie R. R. 3,000

In canal:		Around cape:	
U. S. destroyer	1	Steamers	9
Steamers	3	Tugs	11
Steam lighters	2	Barges	26
Lighters	1	Schooners	4
Tugs	2	Tonnage, estimated	56,410
Barges	3		
Schooners	8		
Tonnage, estimated	16,210		

JUNE 23, 1916.

Passed west:	
Steamer Bunker Hill, Eastern S. S. Co	4,779
Steamer Frances	56
Steam lighter Cornelia, Boston S. & G. Co	285
Steam lighter Palmer, Boston S. & G. Co	124
Schooner Sarah & Lucy	252
Schooner Lizzie J. Call	206
Schooner Chas. E. Wyman	234
Schooner Mary E. Olys	224
Passed east:	
Steamer Massachusetts	4,779
Schooner Eugenie	94
Schooner Ida B. Gibson	235
Schooner Geo. R. Smith	136
Tug Tuton, barge Indiana, Seaboard Trans. Co	2,850
	14,254

BOSTON.

Arrived:	
Steamer Chippewa from New York, Clyde S. S. Co	2,696
Steamer Gloucester from Baltimore, Mer. & Miners T. Co	2,541
Steamer Quantico from Philadelphia, Mer. & Miners T. Co	2,676
Steamed:	
Steamer Ontario from Baltimore, Mer. & Miners T. Co	3,099
Tug Eureka, barge Mount Hope, Staples Trans. Co	1,801
Tug Georges Creek—	
Barge No. 14, Consolidation C. Co	930
Barge No. 21, Consolidation C. Co	905
Barge No. 25, Consolidation C. Co	1,566
Tug Cumberland—	
Barge No. 5, Consolidation C. Co	909
Barge No. 19, Consolidation C. Co	932
Barge No. 23, Consolidation C. Co	1,000

News item: Reading tug Catawissa with barges Yardley, Maple Hill, and Lincoln left Philadelphia 5 a. m., for Boston routed via canal.
Highland Light, 5 p. m., wind NE., 10 miles; clear; smooth sea.
Chatham, 5 p. m., wind S., light breeze; clear:

Passed west—	
Tug Chas. Greenough—	
Barge Providence, Shawmut Trans. Co	1,200
Barge Lynn, Shawmut Trans. Co	1,200
Barge Portsmouth, Shawmut Trans. Co	1,200
Tug Standard—	
Barge S. O. T. Co. No. 57, S. T. Co	806
Barge S. O. T. Co. No. 123, S. T. Co	800
Nobska, passed east, schooner Harry W. Haynes	295
Vineyard Haven, wind, a. m., NW., p. m., E., moderate:	
Arrived eastbound—	
Schooner Rhoda Holmes	375
Schooner William Mason	465
B. I. Hazard	392
Passed westbound—	
Steamer Hewitt	
Steamer Susie P. Oliver	272
Passed eastbound, tug Ontario, towing 3 barges, N. Y., O. & W. R. R.	3,000
	29,060

In canal:		Around cape:	
Steamers	3	Steamers	4
Tugs	1	Tugs	6
Barges	1	Barges	15
Steam lighters	2	Schooners	5
Schooners	7	Tonnage, estimated	29,060
Tonnage, estimated	14,254		

JUNE 25, 1916.

Passed east:

Schooner St. Croix	234
Tug Gwalia, N. E. Coal & Coke Co	415
Tug Cheektowage, towing 3 barges, Lehigh Valley	3,000
Tug Lehigh, towing 3 barges, Lehigh Valley	3,000
Tug Petrel, towing 3 barges, Erie R. R	3,000
Tug Chas. Gallagher—	
Barge Helen Woods, J. Hughes	800
Barge Martin P. Horan, J. Hughes	600
Barge Ida Woods, J. Hughes	800
Barge Easton, Chadwick Co	800
Steam lighter Wm. H. Moody, Lighter R. G. No. 9, Rock. G. Co	200
Steamer Massachusetts, Eastern S. S. Co	4,779

Passed west:

Tug S. Thomas Brown, barge Tipton, Staples T. Co	830
Tug Prudence—	
Barge Karl, Pettinos Bros	408
Barge Varina, Pettinos Bros	441
Schooner Geo. F. Carman	36
Schooner American Team	376
Schooner Florence Thurlow	200
Barge Catherine Horan, J. Hughes	400
Steamer Bunker Hill, Eastern S. S. Co	4,779
	25,098

BOSTON.

Arrived:

Steamer Howard from Norfolk, Mer. & Min. T. Co	3,581
Steamer Persian from Philadelphia, Mer. & Min. T. Co	2,677
Tug Piedmont—	
Barge 7, Consolidation	1,600
Barge 8, Consolidation	1,600
Barge 18, Consolidation	1,600
Tug Honeybrook—	
Barge L. & W. 7, L. & W. Coal Co	1,100
Barge L. & W. 9, L. & W. Coal Co	1,100
Tug Atkins Hughes—	
Barge J. B. King 36, Chadwick Co	1,000
Barge S. T. Co. 4, Chadwick Co	1,000

Steamed:

Steamer Chippewa for Charleston, Clyde S. S. Co	2,696
Steamer Gloucester for Norfolk, Mer. & Min. T. Co	2,541
Steamer Quantico for Philadelphia, Mer. & Min. T. Co	2,676
Steamer Coastwise for Baltimore, N. E. C. & C. Co	4,015
Steamer Hampden for Baltimore, N. E. C. & C. Co	4,721
Steamer William Chisholm for Sewalls Point, Seaboard T. Co	1,581

Vineyard Haven, wind S., fresh; thick and rainy; rough sea:

Arrived:

Eastbound—	
Schooner Mattie J. Alles	229
Schooner James H. Hoyt	414
Schooner Mary A. Hall	381
Schooner Myrtle Leaf (Br.)	401
Westbound, schooner Neva (Br.)	191
East, tug International—	
Barge Phoenix, Reading R. R	1,550
Barge Ontelaunce, Reading R. R	1,175
Barge Draper, Reading R. R	1,450

Vineyard Haven—Continued.
Arrived—Continued.
East, tug Mars—
Barge Logan, Reading R. R..... 1,550
Barge Wiconisco, Reading R. R..... 1,550
Barge Eagle Hill, Reading R. R..... 1,550
West, tug Ontario—
Barge Pilgrim, N. Y. O. & W. R. R..... 2,250
Barge Sydney, N. Y. O. & W. R. R..... 1,275
Barge Metacomet, N. Y. O. & W. R. R..... 1,450
West, tug Security, barge No. 86, Stand. T. Co..... 800

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	7	Tugs	7
Barges	17	Barges	17
Schooners	4	Schooners	5
Steam lighters	1	Tonnage, estimated	49,704
Lighters	1		
Tonnage, estimated	25,298		

JUNE 26, 1916.

Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Schooner Nellie Grant..... 19
Schooner J. Arthur Lord..... 212
Schooner Abbie S. Walker..... 190
Schooner Kennebec..... 187
Passed east:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Schooner Cora M..... 143
Tug Edgar F. Luckenback..... 272
Tug Olympic..... 59
Tug Catawissa—
Barge Yardley, Reading R. R..... 1,550
Barge Maple Hill, Reading R. R..... 1,550
Barge Lincoln, Reading R. R..... 1,450
15,190

Tug Catawissa arrived in Boston June 26.

BOSTON.

Arrived:
Steamer Juniata from Baltimore, Mer. & Min. T. Co..... 3,465
Steamer Bylayl from Norfolk.....
Steamer Nacoochee from Savannah, Ocean S. S. Co..... 2,680
Steamer Bay State from Norfolk, White Oak T. Co..... 1,245
Collier Vulcan—
Barge 286.....
Barge 287.....
Motor barge S. T. No. 62, Standard T. Co..... 1,000
Steamed:
Steamer Leonatus (Br.) for Philadelphia.....
Steamer Howard for Baltimore, Mer. & Min. T. Co..... 3,581
Tug Honeybrook—
Barge Wilkesbarre, L. & W. C. Co..... 1,200
Barge No. 8, L. & W. C. Co..... 953
Barge No. 11, L. & W. C. Co..... 800
Highland Light, wind 5 p. m., SE., 10 miles; clear; smooth sea.
Nobska:
Passed east, tug Standard, towing barge, Standard T. Co..... 1,000
Passed west, tug Valley Forge—
Barge Manheim, Reading R. R..... 955
Barge Cocalico, Reading R. R..... 956
Barge Langhorne, Reading R. R..... 955

Vineyard Haven, wind W., moderate; smooth sea; clear:
Passed east—
Tug Calvert, towing—
Steamer Itaska..... 105
Barge..... 1,000
Tug Lykens, towing 3 barges, Reading..... 3,000
Tug Monocacy, towing 3 barges, Reading..... 3,000
The above two Reading tows probably competing with tug Catawissa which passed through canal and arrived in Boston.
Passed west, schooner Carrie A. Buckman..... 287

In canal:		Around cape:	
Steamers	2	Steamers	7
Tugs	3	Tugs	6
Barges	3	Barges	16
Schooners	5	Colliers	1
		Motor barge	1
Total	13	Schooners	1
Tonnage, estimated	15,190		
		Total	32
		Tonnage, estimated	26,182

JUNE 27, 1916.

Passed west:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Tug Catawissa, towing 3 barges, Reading..... 2,800
Tug Cheektowaga—
Barge 742, Lehigh Valley..... 800
Barge 740, Lehigh Valley..... 800
Barge 704, Lehigh Valley..... 934
Tug Atkins Hughes, towing schooner Jas. B. Drake..... 1,153
Schooner Sallie W. Ponder, Jas. McLaughlin..... 107
Passed east:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Tug Juniata—
Barge Hatteras, Chadwick Co..... 1,220
Barge Canisteo, Chadwick Co..... 1,020
Schooner Kate Pray..... 59
Schooner Lizzie D. Small..... 190
Tug John C. Chandler, barge Ruhama Shaw, L. B. Shaw..... 1,000
19,641

BOSTON.

Arrived:
Steamer Nantucket from Norfolk, Mer. & Min. T. Co..... 2,599
Steamer J. H. Devereaux from Norfolk, Metro. Coal Co..... 1,618
Steamer Brandon from Baltimore..... 1,062
Steamed:
Steamer Anvers (Belg.) for New York.....
Steamer Corfe Castle (Br.) for New York.....
Steamer Bristol for Lamberts Point..... 257
Steamer Persian for Philadelphia, Mer. & Min. T. Co..... 2,677
Steamer Juniata for Norfolk, Mer. & Min. T. Co..... 3,465
Steamer Herman Winter for New York, Eastern S. S. Co..... 2,625
Motor barge No. 62, Standard T. Co..... 800
Tug Concord—
Barge Cardenas, Staples T. Co..... 1,576
Barge Chatham, Staples T. Co..... 1,812
Highland Light, 5. p. m., wind SW., 25 miles; hazy; smooth sea:
Passed west—
Steamer Bylayl.....
Steamer Suffolk, Coastwise S. S. Co..... 4,718
Tug Piedmont—
Barge No. 15, Consolidation C. Co..... 912
Barge No. 17, Consolidation C. Co..... 935
Barge No. 20, Consolidation C. Co..... 940
Chatham, 5 p. m., wind SW., moderate breeze; partly foggy outside.

Nobska:
Passed east—
Tug Cuba—
Barge Gibson, Staples T. Co..... 1,530
2 others, Staples T. Co..... 2,000
Tug Tamaqua—
Barge Barry, Reading R. R..... 1,550
Barge Hammond, Reading R. R..... 1,025
Barge Indian Ridge, Reading R. R..... 1,550
Tug Boswell—
Barge Helen, N. E. C. & Coke Co..... 2,400
Barge Emelie, N. E. C. & Coke Co..... 1,950
Steamer Black Rock, towing barge.....
Passed west—
Tug Tacony, towing 3 barges, Sus. Coal Co..... 3,000
Steamer Euphrates (Belg.)..... 2,809
Tug Germantown—
Barge Ephrata, Reading R. R..... 954
Barge Moselem, Reading R. R..... 963
Barge Paxinos, Reading R. R..... 954
Vineyard Haven, wind a. m., moderate S.; smooth sea: foggy; p. m. clear:
Sailed west, schooner L. L. Hamlin..... 147
Steamed east, tug Fred H. Richards—
Barge No. 3, R. & R. Lime Co..... 800
Barge No. 6, R. & R. Lime Co..... 800
Passed east, steamer Arlington..... 1,446
Passed east, tug Paoli—
Barge Devno, Sus. Coal Co..... 1,100
Barge Nanticoke, Sus. Coal Co..... 1,900
Barge Radner, Sus. Coal Co..... 900

In canal:		Around cape:	
Steamers	2	Steamers	14
Tugs	5	Tugs	9
Barges	9	Barges	25
Schooners	4	Motor barge	1
		Schooners	1
Total	20		
Tonnage estimated	19,641	Total	50
		Tonnage estimated	53,774

JUNE 28.

Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Power barge No. 62, Standard T. Co..... 800
Tug Chas. Gallagher..... 90
Tug May—
Barge Calvin..... 415
Barge Elizabeth..... 440
Barge Summit Hill, L. C. & N. Co..... 739
Barge Avondale, Chadwick Co..... 1,111
Barge Waverly, Chadwick Co..... 1,000
Passed east:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Tug Atkins Hughes, barge I. D. Fletcher, Coast Transit Co..... 1,600
Tug Chas. Gallagher, barge Mary Horan, Jas. Hughes..... 900
Schooner Annie Gus..... 99
Barge Allentown..... 1,200
17,952

BOSTON.

Arrived:
Steamer Kershaw from Baltimore, M. & M..... 2,599
Steamer Parthian from Philadelphia, M. & M..... 2,082
Tug Boxer—
Barge Elk Garden, F. W. Munn..... 1,475
Barge H. A. Allyn, F. W. Munn..... 1,000

Steamed:
- Steamer Nantucket for Baltimore, M. & M..... 2,599
- Steamer Malden for Baltimore, N. E. C. & C. Co..... 5,107
- Tug Cuba, barge Boston, Shawmut S. S. Co..... 1,800

Highland Light, wind SSE., 12 miles; clear; smooth sea:
- Passed east, steamer North Land, Eastern S. S. Co..... 3,282
- Passed west, tug International—
  - Barge Henry Clay, Reading..... 841
  - Barge Glendower, Reading..... 855

Nobska:
- Passed east—
  - Tug Conestoga—
    - Barge Poscopson, Reading..... 1,175
    - Barge Exeter, Reading..... 3,000
    - Barge Paxtang, Reading..... 1,550
- Passed west—
  - Tug Lykens—
    - Barge Mingo, Reading..... 954
    - Barge Beechwood, Reading..... 841
    - Barge Thomaston, Reading..... 693

Vineyard Haven, wind variable, light; smooth sea; foggy:
- Arrived—
  - West, schooner Wawenock..... 325
  - West, tug Mercury—
    - Barge Nay Aug, Chadwick..... 800
    - Barge Hopatcong..... 800
  - East, tug Gylsum King, towing 3 barges..... 2,400
  - West, tug North American, barge Lewis H. Goddard..... 1,191

35,369

In canal:		Around cape:	
Steamers	2	Steamers	5
Tugs	4	Tugs	8
Barges	8	Barges	17
Motor barges	1	Schooners	1
Schooners	1		31
	16	Tonnage, estimated	35,369
Tonnage, estimated	17,952		

News item: Reading tug Catawissa, through canal, arrived in Boston 24 hours ahead of Reading tug International, which went around cape.

JUNE 29.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co..... 4,779
- Tug Albert J. Stone—
  - Barge Stroudsburg, Erie R. R..... 1,070
  - Barge Binghampton, Erie R. R..... 900
  - Barge Passaic, Erie R. R..... 1,525
- Steam lighter Cornelia, B. S. & G. Co..... 285

Passed west:
- Tug Juniata, barge S. T. Co. No. 3, Chadwick Co..... 700
- Lighter Wm. H. Moody, barge R. G. No. 1, Rockport G. Co..... 259
- Barge Rose M. Freney, Jas. Hughes..... 600
- Steamer Bunker Hill, Eastern S. S. Co..... 4,779

14,897

BOSTON.

Arrived:
- Steamer Katahdin from Jacksonville, Clyde Line..... 2,696
- Steamer Gloucester, from Norfolk, M. & M..... 2,541
- Tug Swatara—
  - Barge Neshaminy, Reading..... 1,175
  - Barge Tulpehocken, Reading..... 1,175
  - Barge Suffolk, Reading..... 1,450
- Tug Nottingham—
  - Barge No. 2, L. & W. C. Co..... 1,500
  - Barge No. 10, L. & W. C. Co..... 1,500
  - Barge No. 12, L. & W. C. Co..... 1,500

Steamed:	
Steamer Parthian for Philadelphia, M. & M.	2,082
Steamer Kershaw for Norfolk, M. & M.	2,599
Steamer Middlesex for Norfolk, Coastwise T. Co.	4,727
Tug Tamaqua—	
Barge Maple Hill, Reading	911
Barge Ontelaunee, Reading	739
Barge Phoenix, Reading	901
Tug John G. Chandler, barge Ruth	
Steamer Brandon for Baltimore	1,062
Highland Light, wind, 5 p. m., SW., 20 miles; partly cloudy; smooth sea:	
Passed west, steamer Santa Barbara, J. R. Hanify Co.	695
Passed east, tug Essex, barge R. W. McDonald	
Chatham, 5 p. m., wind S., light breeze; partly cloudy:	
Passed east, tug Albatross—	
Barge Henry Endicott, P. Dougherty	1,200
Barge Georgia, P. Dougherty	2,532
Barge Maine, P. Dougherty	1,000
Passed west—	
Steamer Bay Port, White Oak T. Co.	1,399
Tug Standard, towing barge	800
Nobska:	
Passed west—	
Steamer Flanders (Belg.)	
Steamer Algeni (Belg.)	
Steamer Joancy	
Tug Boswell—	
Barge Sweetser, N. E. C. & C. Co.	800
Barge Linthicum, N. E. C. & C. Co.	800
Steamer Ruth	
Passed east, tug Daniel Willard, towing 2 barges	2,000
Vineyard Haven, wind variable, light; smooth sea; clear:	
Passed west, schooner Labolta	
	37,784

In canal:		Around cape:	
Steamers	2	Steamers	12
Tugs	2	Tugs	9
Barges	6	Barges	19
Steam lighters	2	Schooners	1
	12		41
Estimated tonnage	14,897	Estimated tonnage	37,784

JUNE 30.

Passed west:	
Steamship Massachusetts, Eastern S. S. Co.	4,779
Schooner Portland Packet	91
Schooner Kate L. Pray	59
Schooner Abenaki	176
Schooner Sarah A. Reed	158
Schooner Addie P. McFadden	251
Schooner Genevieve	9
Tug John G. Chandler—	
Barge Ruth, Chadwick	700
Barge Rubanna Shaw, L. B. Shaw	700
Passed east:	
Steamship Bunker Hill, Eastern S. S. Co.	4,779
Tug Mariner	49
Tug, Richard S. Young, 3 barges, N. Y. & B. T. Co.	2,100
Schooner Oakes Ames	254
Schooner Flora Congdon	230
Barge Vale Royal	944
Barge Satilla	944
Barge Sharon, Staples	482
Barge Braddock, Staples	678
	17,383

BOSTON.

Arrived:
- Steamship Ontario from Baltimore, M. & M. — 3,099
- Steamship Quantico from Philadelphia, M. & M. — 2,676
- Steamship City of Atlanta from Savannah, Ocean S. S. Co. — 5,433
- Steamship Bay View from Newport News, White Oak T. Co. — 1,399
- Steamship Meteor from Norfolk, Pacific Coast Co — 2,301
- Steamship Herman Winter from New York, Eastern S. S. Co. — 2,623
- Tug Sea King—
  - Barge Irene, N. E. C. & C. Co. — 1,206
  - Barge Beattie, N. E. C. & C. Co — 1,117

Steamed:
- Steamship Gloucester for Baltimore, M. & M. — 2,541
- Steamship J. H. Devereux for Norfolk, Metro. Coal Co. — 1,618
- Tug Jack E. Scully, barge I. F. Chapman, Thos. J. Scully — 2,146
- Tug Sea King for Norfolk — 123
- Tug Nottingham—
  - Barge, L. & W., No. 5, L. & W. Coal Co. — 650
  - Barge, L. & W., No. 7, L. & W. Coal Co. — 650
  - Barge, L. & W., No. 14, L. & W. Coal Co. — 800

Highland Light, wind, 5 p. m., NW., 7 miles; clear, smooth sea:
- Passed east, steamship North Star — 3,159

Chatham, 5 p. m., wind, NW., light breeze, clear:
- Passed west, tug Boxer—
  - Barge City of San Antonio, F. W. Munn — 1,223
  - Barge Reading, F. W. Munn — 1,000
- Passed east, tug Plymouth, 3 barges, L. & W. Coal Co — 2,100
- Passed west, tug Mars—
  - Barge Rear Ridge, Reading — 910
  - Barge Cleona, Reading — 956
  - Barge Molino, Reading — 954
- Passed west, tug Albert J. Stone—
  - Barge Troy, Erie — 700
  - Barge Pittston, Erie — 700
  - Barge Scranton, Erie — 450
- Passed east, tug Murrell—
  - Barge Annie, N. E. C. & C. Co. — 1,098
  - Barge Edith — 859

Nobska, wind, 11.50 a. m., NW., 7 miles, clear:
- Passed west, tug Wyoming—
  - Barge 767, L. V. R. R. — 600
  - Barge 706, L. V. R. R. — 934
  - Barge 790, L. V. R. R. — 600

Vineyard Haven, wind variable, light, smooth sea, clear:
- Arrived:
  - East, schooner Edward E. Briry — 1,613
  - West, schooner Hattie H. Barbour — 301

46,539

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	3	Tugs	10
Barges	9	Barges	22
Schooners	8	Schooners	2
Total	22	Total	43
Estimated gross tons	17,383	Estimated gross tons	46,539

JULY 2, 1916.

Passed west:
- Steamer Massachusetts, Eastern S. S. Co. — 4,779
- Schooner Nat. Meader — 278
- Schooner Henrietta Whitners — 217
- Schooner C. B. Clark — 194

Passed west—Continued.
- Tug Albatross—
  - Barge Martin Horan, James Hughes 373
  - Barge Mary Horan, James Hughes 400
- Tug Richard F. Young, barge Dorothy Price, N. Y. & B. T. Co 409

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Schooner Allen Guerney 169
- Tug Mercury, towing 3 barges 2,400
- Steam lighter Wm. H. Moody, barge R. G. Co. No. 1, R. G. Co 259

14,257

BOSTON.

Arrived:
- Tug Chas. P. Greenough—
  - Barge Lynn, Shawmut S. S. Co 1,159
  - Barge Portsmouth, Shawmut S. S. Co 1,159
  - Barge Providence, Shawmut S. S. Co 1,159
- Tug Gettysburg—
  - Barge Preston, Reading R. R 855
  - Barge Macungie, Reading R. R 956
  - Barge Saucon, Reading R. R 955
- Tug Ontario—
  - Barge Pilgrim, N. Y. O. & W. R. R. Co 1,000
  - Barge Metacomet, N. Y. O. & W. R. R. Co 800
  - Barge Sidney, N. Y. O. & W. R. R. Co 745
- Steamer City of Columbus from Savannah, Ocean S. S. Co 5,433
- Steamer Juniata from Baltimore, Mer. & Min. T. Co 3,465
- Steamer Bylayl from Norfolk .....

Steamed:
- Steamer Meteor for Norfolk, Pacific Coast S. S. Co 2,301
- Steamer Coastwise for Norfolk, Coastwise S. S. Co 4,015
- Steamer Katahdin for Jacksonville, Clyde S. S. Co 2,696
- Tug Sea King—
  - Barge Bessie, N. E. C. & Coke Co 400
  - Barge Clara, N. E. C. & Coke Co 828
  - Barge Emelie, N. E. C. & Coke Co 1,069

Vineyard Haven, wind SW., fresh; choppy sea; clear:
- Passed east—
  - Tug Honeybrook, towing 3 barges, L. & W. Coal Co 2,400
  - Tug Standard, towing 2 barges, Standard T. Co 2,000
- Passed west—
  - Tug Swatara—
    - Barge Tabor, Reading R. R 963
    - Barge Hammond, Reading R. R 693
    - Barge Lincoln, Reading R. R 855
  - Schooner Mattie Newman 354
  - Schooner Julia Frances 183
  - Schooner Wesley Abbott 144
  - Schooner Latooka (Br.) .....

In canal:		Around cape:	
Steamers	2	Steamers	6
Tugs	3	Tugs	7
Barges	7	Barges	20
Schooners	4	Schooners	4
Steam lighters	1		
Total	17	Total	37
Tonnage estimated	14,257	Tonnage estimated	36,587

JULY 4, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Schooner Chas. H. Trickey 281

Passed west, steamer Massachusetts, Eastern S. S. Co 4,779

9,839

BOSTON.

Arrived:	
Tug Germantown—	
Barge Cocalico, Reading R. R.	956
Barge Silver Brook, Reading R. R.	904
Barge Skippack, Reading R. R.	739
Tug Taconi—	
Barge Malvern, Susquehanna Coal Co.	844
Barge Upton, Susquehanna Coal Co.	843
Barge Haverford, Susquehanna Coal Co.	678
Steamer Chippewa from Jacksonville, Clyde S. S. Co.	2,696
Steamer Kirshaw from Norfolk, Merchants & Miners S. S. Co.	2,599
Steamer George Hawley, Norfolk, Va. T. Co.	2,549
Steamed:	
Steamer Jelling (Dan.), for New York	2,639
Steamer City of Columbus for Savannah, Ocean S. S. Co.	5,423
Steamer Howard for Norfolk, Merchants & Miners T. Co.	3,581
Steamer Persian for Philadelphia, Merchants & Miners T. Co.	2,677
Steamer Everett for Norfolk, New Eng. Coal & Coke Co.	5,107
Tug Eureka—	
Barge Foster, Staples Trans. Co.	841
Barge Gibson, Staples Trans. Co.	839
Vineyard Haven, wind N., moderate breeze, cloudy, smooth sea:	
Arrived eastbound—	
Schooner Emily S. Baymore	256
Tug Valley Forge, towing 3 barges, Reading	2,200
Tug Covalia—	
Barge Harvard, N. E. Coal & C. Co.	1,603
Barge Flora, N. E. Coal & C. Co.	865
Passed westbound—	
Tug Ontario—	
Barge Smyrna, N. Y. O. & W. R. R.	741
Barge Ellenville, N. Y. O. & W. R. R.	858
Barge Cadosia	756
Tug Savage—	
Barge No. 18, Con. Coal Co.	936
Barge No. 7, Con. Coal Co.	898
Barge No. 8, Con. Coal Co.	924
Tug Murrell—	
Barge Helen, N. E. C. & C. Co.	1,285
Barge Beattie, N. E. C. & C. Co.	1,117
Tug F. E. Richards—	
Barge R. & R. L. Co. No. 2, Chadwick & Co.	800
Barge Camden, Chadwick & Co.	700
Barge Easton, Chadwick & Co.	830
Tug Luckenbach, barge W. F. Babcock, Luckenbach S. S. Co.	2,128
Sailed east—	
Schooner Rosalie Belliveau (Br.)	239
Schooner William Cobb	424
Schooner Jennie Righter	647
Sailed west—	
Schooner Annie B. Mitchell	463
Schooner Leonard C. (Br.)	
Schooner Clifford I. White	305
Schooner Senator Saulsbury	107
Schooner Colin C. Baker	410
Schooner Sawyer Bros.	347
	53,754

In canal:		Around cape:	
Steamers	2	Steamers	8
Schooners	1	Tugs	10
		Barges	25
		Schooners	10
Total	3	Total	53
Estimated tonnage	9,839	Estimated tonnage	53,754

JULY 5, 1916.

Passed west, steamer Bunker Hill, Eastern S. S. Co	4,779
Passed east:	
Steamer J. H. Devereaux, Met. Coal Co	1,618
Steamer Massachusetts, Eastern S. S. Co	4,779
Schooner Wm. D. Hilton	324
	11,500

BOSTON.

Arrived:	
Steamer Parthian from Philadelphia, Merchants & Miners T. Co	2,082
Steamer Nantucket from Baltimore, Merchants & Miners T. Co	2,599
Steamed:	
Steamer Newguay (Br.) for New York	
Steamer Bylayl for Norfolk	
Steamer Kershaw for Baltimore, Merchants & Miners T. Co	2,599
Tug Germantown—	
Barge Indian Ridge, Reading Railroad Co	910
Barge Neshaminny, Reading Railroad Co	721
Barge Richardson, Reading Railroad Co	693
Tug Gettysburg—	
Barge Bast, Reading Railroad Co	693
Barge Merriam, Reading Railroad Co	855
Barge Yardley, Reading Railroad Co	963
Highland Light, 5 p. m., wind NE., 8 miles, cloudy, rough sea.	
Chatham, 5 p. m., wind NE., strong breeze, cloudy:	
Passed east, steamer North Land	3,282
Nobska:	
Passed west, tug Daniel Willard towing 3 barges, Morris Adeler	2,100
Passed east:	
Steamer Bay Port, White Oak T. Co	1,399
Barge Daniel Munro	
Vineyard Haven, wind NE., fresh, choppy sea, cloudy:	
Sailed west, schooner Gladys E. Whidden (Br.)	214
Sailed east—	
Schooner George Churchman	281
Tug Georges Creek—	
Barge No. 14, Con. Coal Co	927
Barge No. 21, Con. Coal Co	905
Barge No. 25, Con. Coal Co	1,566
Tug Tuton—	
Barge Indiana, Seaboard Trans. Co	1,626
Barge Pequest, Seaboard Trans. Co	700
Barge Chemung, Seaboard Trans. Co	600
Barge Tobyhanna, Seaboard Trans. Co	700
Tug Chas. W. Parker, Jr.—	
Barge Cassie, N. E. Coal & Coke Co	948
Barge Nanticoke, P. Dougherty	771
	28,134

In canal:		Around cape:	
Steamers	3	Steamers	7
Schooners	1	Tugs	7
		Barges	19
Total	4	Schooners	2
Tonnage, estimated	11,500	Total	35
		Tonnage, estimated	28,134

JULY 6, 1916.

Passed east:	
Steamer Bunker Hill, Eastern S. S. Co	4,779
Tug Albatross, P. Dougherty	286
Tug Albert J. Stone—	
Barge Albany, Erie R. R	659
Barge Edgewater, Erie R. R	864
Barge Hawthorne, Erie R. R	680
Barge Rahn, L. C. & Nav. Co	932
Lighter Palmer, B. Sand & G. Co	124

Passed west:
- Tug Neponset, towing—
  - Schooner Stanley M. Seaman 1,060
  - Barge Allentown 842
- Steamer Massachusetts 4,779
- United States destroyer—
  - Jenkins 742
  - Conynham 1,090

16,837

BOSTON.

Arrived:
- Steamer Chippewa from Jacksonville, Clyde S. S. Co 2,696
- Steamer Brandon from Baltimore 1,062
- Tug Standard—
  - Barge No. 124, Standard T. Co 800
  - Barge No. 5, Standard T. Co 800
  - Barge No. 123, Standard T. Co 952
- Tug International—
  - Barge Thomaston, Reading R. R 693
  - Barge Brookside, Reading R. R 841
- Tug Concord, barge Chatham, Staples Co 353
- Tug Nottingham—
  - Barge L. & W. Co. No. 9, L. & W. Coal Co 685
  - Barge L. & W. Co. No. 8, L. & W. Coal Co 953
  - Barge L. & W. Co. No. 7, L. & W. Coal Co 685
- Tug Prudence—
  - Barge Ampere, Pettinos Bros 698
  - Barge John S. Pancake 836
  - Barge Reading, F. W. Munn 1,200

Steamed:
- Steamer Parthian for Philadelphia, Mer. & Min. T. Co 2,082
- Steamer Nantucket for Norfolk, Mer. & Min. T. Co 2,599
- Steamer Malden for Baltimore, N. E. C. & Coke Co 5,107
- Steamer Hindoo (Br.) for New York 622
- Steamer Liege (Belg.) for New York .....
- Steamer Herman Winter for New York, Eastern S. S. Co 2,625
- Steamer Hampden for Baltimore, Coastwise S. S. Co 4,725
- Tug Plymouth—
  - Barge L. & W. Co. No. 4, L. & W. Coal Co 685
  - Barge L. & W. Co. No 10, L. & W. Coal Co 685
  - Barge L. & W. Co. No. 12, L. & W. Coal Co 862
- Tug Honeybrook—
  - Barge L. & W. Co. No. 1, L. & W. Coal Co 852
  - Barge L. & W. Co. No. 2, L. & W. Coal Co 958
  - Barge L. & W. Co. No. 6, L. & W. Coal Co 685
- Tug Security—
  - Barge S. T. Co. No. 57, Standard T. Co 1,381
  - Barge S. T. Co. No. 86, Standard T. Co 1,102
- Tug Chas. P. Greenough—
  - Barge Irene, N. E. C. & Coke Co 1,206
  - Barge Portsmouth, N. E. C. & Coke Co 1,159

Highland Light, wind 5 p. m. NE., 5 miles; clear; smooth sea.

Chatham, 5 p. m., wind NE., light breeze, clear:
- Passed west, steamer Black Rock—
  - Barge Iron Queen 1,384
  - One other barge 1,000

Nobska, wind NNE., 12 miles; clear:
- Passed west—
  - Steamer Bay View, White Oak T. Co 1,399
  - Tug Lenape—
    - Barge Draper, Reading R. R 855
    - Barge Tulpehocken, Reading R. R 721

Vineyard Haven:
- Passed east, schooner Charles L. Jeffrey 348

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	3	Tugs	10
Barges	5	Barges	26
Schooners	1	Schooners	1
Lighters	1		
United States destroyers	2	Total	48
Total	14	Tonnage, estimated	46,296
Tonnage, estimated	16,837		

JULY 7, 1916.

Passed west, steamer Bunker Hill, Eastern S. S. Co 4,779
Passed east—
Steamer Massachusetts, Eastern S. S. Co 4,779
Schooner American Eagle 148
9,706

BOSTON.

Arrived:
Steamer Gloucester from Norfolk, Mer. & Min. T. Co 2,541
Steamer Quantico from Philadelphia, Mer. & Min. T. Co 2,676
Steamer Nacoochee from Savannah, Ocean S. S. Co 2,680
Steamer H. M. Whitney from New York, Eastern S. S. Co 2,706
Steamed:
Steamer Ontario for Baltimore, Mer. & Min. T. Co 3,099
Steamer Middlesex for Norfolk, Coastwise T. Co 4,727
Steamer J. H. Devereux for Norfolk, Metro. Coal Co 1,618
Steamer George Hawley for Norfolk, B. Va. T. Co 2,549
Steamer Karonga (Br.) for New York 4,665
Tug Chas. W. Parker, jr.—
Barge Biwabik, N. E. C. & Coke Co 1,401
Barge Edith, N. E. C. & Coke Co 800
Tug International—
Barge Barry, Reading 954
Barge Silver Brook, Reading 904
Barge Cacoosing, Reading 721
Steamer Republica Argentina (Belg.) for New York .....
Highland Light, wind 5 p. m. SW., 38 miles; clear; smooth sea:
Passed west—
Steamer Coastwise, Coastwise S. S. Co 4,015
Steamer Joancy .....
Passed east, tug Tamaqua—
Barge Manheim, Reading 955
Barge Marion, Reading 954
Barge Mingo, Reading 954
Passed west, tug Wyoming—
Barge 700, Lehigh Valley 934
Barge 766, Lehigh Valley 600
Barge 765, Lehigh Valley 600
Chatham, wind 5 p. m. SW., fresh; clear:
Passed east—
Steamer Meteor, Pac. Coast S. S. Co 2,301
Tug Gwalia—
Barge Flora, N. E. C. & Coke Co 800
Barge Harvard, N. E. C. & Coke Co 1,603
Nobska, wind 4.30 p. m. SW., 10 miles; fair:
Passed west—
Tug Valley Forge—
Barge Macungie, Reading 956
Barge Mahanoy, Reading 855
Barge Skippack, Reading 739
Tug Carlisle—
Barge Kimberton, Reading 955
Barge Rutherford, Reading 955
Barge Pocopson, Reading 721

Nobska—Continued.
Passed west—Continued.
Tug Patience—
Barge Penn, F. W. Munn..... 1,800
Barge Elk Garden, F. W. Munn..... 800
Barge Larimer, F. W. Munn..... 700
Passed east—
Tug Lykens—
Barge Glendower, Reading..... 855
Barge Henry Clay, Reading..... 841
Barge Spring, Reading..... 1,780
Schooner Thos. H. Lawrence..... 374
Vineyard Haven, wind SW., fresh, choppy sea, clear:
Sailed east—
Schooner Chas. W. Alcott..... 296
Schooner Saml. Slick (Br.).....

In canal:		Around cape:	
Steamers	2	Steamers	13
Schooners	1	Tugs	9
		Barges	25
Total	3	Schooners	3
Tonnage, estimated	9,706	Total	50
		Tonnage, estimated	58,384

JULY 9, 1916.

Passed west:
Steamer Bunker Hill, Eastern S. S. Co..... 4,779
Tug W. S. Taylor, Schooner H. L. Peckham, Geo. Krumm..... 734
Tug Albatross—
Barge Georgia, P. Dougherty..... 1,318
Barge Maine, P. Dougherty..... 1,110
Barge Ida Woods, Jas. Hughes..... 524
Lighter H. C. R..... 300
Two scows..... 600
Passed east, steamer Massachusetts..... 4,779
14,144

BOSTON.

Arrived:
Tug Richmond, barge Geo. R. Skofield (left barge Iowa at New Bedford), Seaboard Trans. Co..... 1,728
Tug Edgar F. Luckenbach—
Barge Washington, Luckenbach S. S. Co..... 1,724
Barge West Point, Luckenbach S. S. Co..... 1,213
Steamer Persian from Philadelphia, Mer. & Miners T. Co..... 2,677
Steamer Howard from Norfolk, Mer. & Miners T. Co..... 3,581
Vineyard Haven:
Passed—
Steamer Chippewa for Jacksonville..... 2,696
Steamer Brandon for Baltimore..... 1,062
Tug Nottingham, towing 3 barges, L. & W. Coal Co..... 2,100
16,781

In canal:		Around cape:	
Steamers	2	Steamers	4
Tugs	2	Tugs	3
Barges	3	Barges	6
Schooners	1		
Lighters	1	Total	13
Scows	2	Tonnage, estimated	16,781
Total	11		
Tonnage, estimated	14,144		

JULY 10, 1916.

Passed west, steamer Massachusetts, Eastern S. S. Co	4,779
Passed east—	
Steamer Bunker Hill, Eastern S. S. Co	4,779
Tug Perth Amboy, 3 barges, Lehigh Valley	2,200
	11,758

BOSTON.

Arrived:	
Steamer Juniata from Baltimore, Mer. & Min. T. Co	3,465
Steamer Eptalofos (Br.) from Savannah	
Steamer City of Atlanta from Savannah, Ocean S. S. Co	5,433
Steamer Bylayl from Norfolk	
Steamer Herman Winter from New York, Eastern S. S. Co	2,625
Steamed:	
Steamer Kakata Maru (Jap.) for New York	
Steamer Howard for Newport News, Mer. & Min. T. Co	3,581
Tug Conestoga—	
Barge Brookside, Reading	841
Barge Cocalico, Reading	956
Tug Edgar F. Luckenbach—	
Barge General Knox, Luck. S. S. Co	1,587
Barge Solitaire, Luck. S. S. Co	1,515
Tug Prudence—	
Barge H. A. Allyn, F. W. Munn	1,000
Barge Harrisburg, F. W. Munn	1,283
Highland Light, 5 p. m., light breeze, dense fog, smooth sea.	
Nobska, wind ESE., 2 miles, fair:	
Passed east, tug Coving, towing barges, Seaboard T. Co	1,600
Passed west, tug Catawissa—	
Barge Exeter, Reading	1,780
Barge Paxtang, Reading	954
Barge Logan, Reading	955
Passed east, tug Fred E. Richards, towing 2 barges, R. & R. Lime Co	1,600
Passed west, tug Tacony—	
Barge Devon, Sus. Coal Co	724
Barge Nanticoke, Sus. Coal Co	771
Barge Malvern, Sus. Coal Co	844
Vineyard Haven:	
Arrived east—	
Tug Essex—	
Barge Scranton, Erie R. R	500
Barge Troy, Erie R. R	700
Barge Hackensack, Erie R. R	860
Tug Paoli—	
Barge Oxford, Sus. Coal Co	836
Barge Stratford, Sus. Coal Co	678
Barge Radnor, Sus. Coal Co	678
Tug Lehigh—	
Barge No. 767, Lehigh Valley	600
Barge No. 706, Lehigh Valley	934
Barge No. 785, Lehigh Valley	700
Passed west—	
Tug Concord, towing 3 barges, Staples T. Co	2,100
Tug Scranton, towing 3 barges, Chadwick Co	2,100

In canal:		Around cape:	
Steamers	2	Steamers	7
Tugs	1	Tugs	12
Barges	3	Barges	31
Total	6	Total	50
Tonnage, estimated	11,758	Tonnage, estimated	42,140

JULY 11, 1916.

Passed east:	
Steamer Massachusetts, Eastern S. S. Co	4,779
Tug Monocacy—	
Barge Enterprise, Reading	901
Barge Lincoln, Reading	855
Barge Beechwood, Reading	841
Tug Neponset—	
Barge Junior, L. C. & N. Co	430
Barge Tamaqua, L. C. & N. Co	830
Tug Narrangansett, barge Tipton, Staples T. Co	830
U. S. steamer Azalea, Lighthouse Department	500
U. S. monitor Ozark, United States Navy	3,225
Schooner Irene E. Mersevey	244
Passed west:	
Steamer Bunker Hill, Eastern S. S. Co	4,779
Tug Blue Jay	18
U. S. steamer Azalea, Lighthouse Dept	500
	18,732

BOSTON.

Arrived:	
Steamer Nantucket from Norfolk, Mer. & Min. T. Co	2,599
Steamer Nordbeen (Dan.) from Norfolk	2,417
Steamed:	
Steamer Harvey H. Brown for Sewalls Point, from Cleveland, Ohio	2,673
Steamer Bay Port from Sewalls Point, White Oak T. Co	1,399
Steamer Everett for Norfolk, N. E. C. & Coke Co	5,107
Steamer Juniata for Norfolk, Mer. & Min. T. Co	3,465
Steamer City of Atlanta for Savannah, Ocean S. S. Co	5,433
Steamer Persian for Philadelphia, Mer. & Min. T. Co	2,677
Steamer Bylayl for Norfolk	
Steamer Herman Winter for New York, Eastern S. S. Co	2,625
Highland Light, wind 5 p. m. SW., 25 miles; foggy; smooth sea:	
Passed west—	
Steamer Suffolk, Coastwise S. S. Co	4,718
Tug Georges Creek—	
Barge 21, Consolidation C. Co	905
Barge 24, Consolidation C. Co	1,566
Chatham, 5 p. m., wind SW., fresh; dense fog:	
Passed east, tug Gettysburg—	
Barge Pennypack, Reading	739
Barge Tohickon, Reading	739
Barge Eagle Hill, Reading	911
Nobska, 4.30 p. m., wind SW., 10 miles; dense fog:	
Passed east, tug Plymouth—	
Barge L. & W. No. 11, L. & W. C. Co	800
Barge L. & W. No. 14, L. & W. C. Co	800
One other barge, L. & W. C. Co	800
Passed west—	
Tug Lykens—	
Barge Conewago, Reading	956
Barge Manatawny, Reading	721
Barge Preston, Reading	855
Tug Tamaqua—	
Barge Langhorne, Reading	955
Barge Leesport, Reading	963
Barge Temple, Reading	963
Passed east—	
Tug Boswell—	
Barge Alice, N. E. C. & Coke Co	640
Barge Salem	1,159
Schooner Roger Drury	360
Vineyard Haven, wind S., moderate; smooth sea; thick fog.	

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	4	Tugs	6
Barges	6	Barges	16
United States lighthouse steamers	2	Schooners	1
United States Navy monitor	1	Total	34
Schooners	1	Tonnage, estimated	47,945
Total	16		
Tonnage, estimated	18,732		

JULY 12, 1916.

Passed west:
- Steamer Massachusetts, Eastern S. S. Co. — 4,779
- Lighter Palmer, B. S. & G. Co. — 124
- Tug Monocacy, towing 3 barges, Reading R. R. — 2,500
- Tug Cheektowaga, towing 2 barges, Lehigh Valley — 1,500
- Tug Gwalia, barge Providence, N. E. C. & Coke Co. — 1,159
- Schooner Sarah L. Davis — 180
- Schooner American Eagle — 148
- Schooner Henrietta Simmons — 228

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co. — 4,779
- Auxiliary schooner Rob Roy — 111

15,508

BOSTON.

Arrived:
- Steamer Bristol from Norfolk — 257
- Steamer H. M. Whitney from New York, Eastern S. S. Co. — 2,706
- Steamer Parthian from Philadelphia, Mer. & Min. T. Co. — 2,082
- Steamer Kershaw from Baltimore, Mer. & Min. T. Co. — 2,599
- Steamer J. H. Devereux from Norfolk, Metro. Coal Co. — 1,618

Steamed:
- Steamer Nantucket for Norfolk, Mer. & Min. T. Co. — 2,599
- Steamer Bay State for Norfolk, White Oak T. Co. — 1,245

Highland Light, 5 p. m., wind SW., 25 miles; hazy; smooth sea.

Chatham, 5 p. m., wind SW., fresh breeze; thick fog.

Nobska, 1.30 p. m., wind WSW., 12 miles; dense fog:
- Passed east, steamer Onandaga, Clyde S. S. Co. — 2,696

Vineyard Haven, wind SW., fresh; choppy sea; foggy:

Sailed east—
- Schooner Emily F. Northam — 332
- Schooner Eva A. Danenhower — 228
- Schooner Fred B. Balano — 263

Steamed east—
- Steamer Bay Port, White Oak T. Co. — 1,399
- Tug Lenape, towing 3 barges, Reading R. R. — 2,400
- Tug Swatara, towing 3 barges, Reading R. R. — 2,400

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	3	Tugs	2
Barges	6	Barges	6
Schooners	3	Schooners	3
Lighter	1	Total	20
Auxiliary schooner	1	Tonnage, estimated	22,824
Total	16		
Tonnage, estimated	15,508		

JULY 13, 1916.

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co. — 4,779
- Tug Richard F. Young, towing 4 barges, N. Y. & B. Trans. Co. — 2,400
- Tug May, towing 2 barges, Pettinos Bros. — 1,600
- Lighter Cornelia, B. S. & G. Co. — 285

Passed east:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Lighter Cornelia, B. S. & G. Co. 285
- Tug John G. Chandler, towing 2 barges. 800
- Tug A. J. Stone—
  - Barge Riverside, Erie. 800
  - Barge Rondout, Erie. 800
  - Barge Pittston. 700
- Schooner Mary E. Olys. 224
- Schooner Charlotte T. Sibley. 376
- Schooner Mary Weaver. 222
- Schooner James Young. 261
- Schooner Sallie Ponder. 107

18,418

BOSTON.

Arrived:
- Steamer Gloucester from Norfolk, Mer. & Miners T. Co. 2,541
- Steamer Katahdin from Charleston, Clyde Steamship Co. 2,696
- Steamer Geo. Hawley from Newport News, B. & Va. T. Co. 2,549

Steamed:
- Steamer Kershaw for Norfolk, Mer. & Miners T. Co. 2,599
- Steamer Parthian for Philadelphia, Mer. & Miners T. Co. 2,082
- Steamer Coastwise for Baltimore, Coastwise S. S. Co. 4,015
- Tug Leader, barge Sansford, L. C. & N. Co. 830
- Tug Boswell—
  - Barge Annie, N. E. C. & C. Co. 1,098
  - Barge Cassie, N. E. C. & C. Co. 800
  - Barge Harry F. Hooper, N. E. C. & C. Co. 800
- Tug W. A. Luckenbach—
  - Barge Old Dominion, Luckenbach S. S. Co. 1,802
  - Barge West Point, Luckenbach S. S. Co. 1,213

Highland Light, wind, noon, SW., 25 miles; foggy; smooth sea:
- Passed west, steamer Dania (Dan.). 3,462

Chatham, wind SW., fresh breeze; fog cleared:
- Passed west, tug Gettysburg—
  - Barge Henry Clay, Reading. 841
  - Barge Bethayres, Reading. 955
  - Barge Saucon, Reading. 955
- Passed east, tug Sea King—
  - Barge Clara, N. E. C. & C. Co. 828
  - Barge Emelie, N. E. C. & C. Co. 1,069
  - Barge Sweetser, N. E. C. & C. Co. 800

Vineyard Haven, wind SW., fresh; choppy sea; raining:
- Arrived east—
  - Schooner Sarah Eaton. 199
  - Tug Ontario, towing 3 barges, N. Y. O. & W. 2,700
  - Tug Carlisle, towing 3 barges, Reading. 2,500
  - Tug Valley Forge, towing 3 barges, Reading. 2,500
- Arrived west—
  - Tug Piedmont, towing 3 barges., L. C. & N. Co. 2,100
  - Tug Richmond, barge Geo. R. Stetson, Sea T. Co. 800
- Arrived east, tug Savage, towing 3 barges, Con. Coal Co. 2,400

45,134

In canal:

Steamers	2
Tugs	4
Barges	11
Lighters	2
Schooners	5
Total	24
Tonnage, estimated	18,418

Around cape:

Steamers	7
Tugs	11
Barges	28
Schooner	1
Total	47
Tonnage, estimated	45,134

JULY 14, 1916.

Passed west:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Steamer J. H. Devereux, Met. Coal Co. 1,618
- Tug Narragansett—
  - Barge Rahn, Chadwick & Co. 932
  - Barge Hatteras, Chadwick & Co. 788
- Lighter Eureka, B. S. & G. Co. 471

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Lighter Cornelia, B. S. & G. Co. 285
- Tug W. S. Taylor—
  - Barge Easton, L. C. & N. Co. 830
  - Barge Summitt Hill, L. C. & N. Co. 700
  - Barge Sharon, L. C. & N. Co. 482
  - Barge Cohocton, L. C. & N. Co. 700

16,364

BOSTON.

Arrived:
- Steamer Ontario, from Baltimore, Mer. & Miners T. Co. 3,099
- Steamer Quantico, from Philadelphia, Mer. & Miners T. Co. 2,676
- Steamer Herman Winter, New York 2,625
- Tug John G. Chandler—
  - Barge Ruhama Shaw, L. B. Shaw & Co. 1,000
  - Barge Lottie, L. B. Shaw & Co. 700

Steamed:
- Steamer Gloucester, for Baltimore, Mer. & Miners T. Co. 2,541
- Steamer Middlesex, for Norfolk, Mer. & Miners T. Co. 4,727
- Tug Plymouth—
  - Barge L. & W. C. Co. 5, L. & W. Coal Co. 700
  - Barge L. & W. C. Co. 9, L. & W. Coal Co. 700
- Steamer Newton, for Newport News, N. E. C. & C. Co. 5,194
- Steamer Malden, for Sewall Point, N. E. C. & C. Co. 5,107

Highland Light, wind, 5 p. m., NE., 12 miles, clear, smooth sea.

Nobska, wind NE., 10 miles, cloudy:
- Passed west, steamer Bay Port, White Oak Trans. Co. 1,399

Vineyard Haven, wind NE., moderate, choppy sea:
- Arrived east—
  - Schooner Wm. Jones 302
  - Schooner Moran (Br.) .....
  - Tug Wyoming, towing 3 barges, Lehigh Valley 2,400
  - Tug Catawissa—
    - Barge Oley, Reading R. R. 1,780
    - Barge Kimberton, Reading R. R. 955
    - Barge Macungie, Reading R. R. 956
  - Tug International—
    - Barge Pocopson, Reading R. R. 721
    - Barge Rutherford, Reading R. R. 955
    - Barge Neshaminy, Reading R. R. 721

39,258

In canal:		Around cape:	
Steamers	3	Steamers	8
Tugs	2	Tugs	5
Lighters	2	Schooners	3
Barges	6	Barges	13
Total	13	Total	29
Tonnage, estimated	16,364	Tonnage, estimated	39,258

JULY 16, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co. 4,779
- Lighter Eureka, B. S. & G. Co. 471
- Schooner Vineyard 215
- Tug Prudence, barge Varina, F. W. Munn 441

Passed west:
Steamer Massachusetts, Eastern S. S. Co..... 4,779
Tug Waltham, barge No. 36..... 800

11,485

BOSTON.

Arrived:
Steamer Juniata, from Norfolk, Mer. & Miners T. Co..... 3,466
Steamer Persian, from Philadelphia, Mer. & Miners T. Co..... 2,677
Tug Nottingham—
Barge L. & W. No. 3, L. & W. Coal Co..... 800
Barge L. & W. No. 6, L. & W. Coal Co..... 700
Barge L. & W. Co. No. 12, L. & W. Coal Co..... 800
Tug Murrell—
Barge Helen, N. E. C. & C. Co..... 1,285
Barge Beattie, N. E. C. & C. Co..... 1,117
Tug Patience—
Barge Penn, F. W. Munn..... 1,849
Barge Hampshire, F. W. Munn..... 800
Barge Elk Garden, F. W. Munn..... 800
Steamed:
Tug International—
Barge Enterprise, Reading R. R..... 901
Barge Lincoln, Reading R. R..... 855
Barge Phoenix, Reading R. R..... 901
Tug Carlisle, towing 3 barges, Reading R. R..... 2,500
Steamer Katahdin, for Jacksonville, Clyde S. S. Co..... 2,696
Steamer Geo. Hawley, for Sewalls Point, Boston & Va. S. S. Co..... 2,549
Vineyard Haven, wind SW., fresh, choppy sea, clear:
Passed west, schooner Spartel..... 132
Passed east, tug Honeybrook, towing 3 barges, L. & W. Coal Co..... 2,400
Passed west, tug M. E. Luckenbach—
Barge San Joaquin, Luckenbach S. S. Co..... 1,551
Barge Washington, Luckenbach S. S. Co..... 1,724
Sailed east, schooner Jessie Ashley (Br.)..... 143

30,645

In canal:		Around cape:	
Steamers	2	Steamers	4
Tugs	2	Tugs	7
Barges	2	Barges	19
Schooner	1	Schooners	2
Lighter	1		
Total	8	Total	32
Tonnage, estimated	11,485	Tonnage, estimated	30,645

REMARKS.—Buzzards Bay: July 16, steamer William Chisholm, from Norfolk for Boston, heavily laden, went ashore at 8.30 this evening in the Cape Cod Canal, near Bourneville. She filled with water, and lies well over on her side, obstructing passage through the canal for large craft. A tug met the steamer Bunker Hill, from Boston for New York at the entrance to the canal, notifying her of the obstruction. The steamer turned about and went outside the cape. A wrecking crew will arrive here to-morrow morning to float the steamer.

JULY 17, 1916.

Closed, account steamer Wm. Chisholm ashore.

BOSTON.

Arrived:
Steamer Bylayl, from Norfolk.....
Steamer Nacoochee from Savannah, Ocean S. S. Co..... 2,680
Steamer Massachusetts from New York, Eastern S. S. Co..... 4,779
Steamer Howard from Baltimore, Mer. & Min. T. Co..... 3,581
Tug Lykens—
Barge Barry, Reading R. R..... 954
Barge Cacoosing, Reading R. R..... 721
Barge Mahanoy, Reading R. R..... 855

Arrived—Continued.
Tug Prudence, barge Vienna, F. W. Munn 700
Tug Conestoga—
Barge Ontelaunce, Reading R. R 739
Barge Logan, Reading R. R 955
Barge Paxtang, Reading R. R 954
Steamed:
Steamer Hampden for Baltimore, Coastwise S. S. Co 4,725
Steamer Bunker Hill for New York, Eastern S. S. Co 4,779
Steamer Juniata for Baltimore, Mer. & Min. T. Co 3,465
Steamer Onondaga for Charleston, Clyde S. S. Co 2,696
Tug A. J. Stone—
Barge Rondout, Erie R. R 800
Barge Pittston, Erie R. R 700
Barge Hackensack, Erie R. R 800
Tug Carlisle—
Barge Beechwood, Reading R. R 841
Barge Eagle Hill, Reading R. R 911
Barge Pickering, Reading, R. R 739
Tug E. L. Pillsbury, barge No. 20 800
Tug Paoli—
Barge Haverford, Susquehanna Coal Co 678
Barge Oxford, Susquehanna Coal Co 836
Barge Upton, Susquehanna Coal Co 843
Tug Waltham, J. B. King Co., No. 36, J. B. King & Co 800
Highland Light, wind 5.20 p. m., SW.; 3 miles; foggy; smooth sea.
Vineyard Haven, wind S., light; smooth sea; p. m., raining:
Sailed east—
Schooner Ernst T. Lee .....
Tug Tacony—
Barge Nanticoke, P. Dougherty 771
Barge Malvern, Susquehanna Coal Co 844
Barge Devon, Susquehanna Coal Co 724
Tug Tamaqua—
Barge Draper, Reading R. R 855
Barge Silver Brook, Reading R. R 904
Barge Skippack, Reading R. R 739
46,168
The Tamaqua arrived Wings Neck July 16 to go through canal.
Around cape:
Steamers 8
Tugs 10
Barges 24
Schooners 1
Total 43
Tonnage, estimated 46,168

JULY 18, 1916.

Passed west:
Barge Indiana, Seaboard Trans. Co 1,626
Barge Vale Royal, Seaboard Trans. Co 944
2,570

BOSTON.

Arrived:
Steamer Kershaw from Norfolk, Mer. & Miners T. Co 2,599
Steamer Bunker Hill from New York, Eastern S. S. Co 4,779
Steamed:
Steamer Persian for Norfolk, Mer. & Miners T. Co 2,677
Steamer Howard for Baltimore, Mer. & Miners T. Co 3,581
Steamer Massachusetts for New York, Eastern S. S. Co 4,779
Steamer Brandon for Baltimore 1,062
Steamer Onondaga for Charleston, Clyde S. S. Co 2,696
Tug Patience—
Barge Reading, F. W. Munn 1,283
Barge C. F. Pritchard, F. W. Munn 861

Steamed—Continued.
Tug Wyoming, barge No. 706, Lehigh Valley..... 934
Tug Savage—
Barge No. 5, Lehigh Valley..... 934
Barge No. 10, Lehigh Valley..... 800
Highland Light, wind 5 p. m., SW., 20 miles; partly cloudy and foggy; smooth sea:
Chatham, wind S., moderate breeze; clear:
Passed tug Cheektowaga, towing 3 barges, Lehigh Valley..... 2,500
Nobska, wind SW., 4 miles; clear:
Passed east—
Tug S. T. No. 2—
Barge S. T. Co. No. 6, Stand. T. Co..... 1,000
Barge S. T. Co. No. 124, Stand. T. Co..... 1,000
Tug Armenia—
Barge Nay Aug, Chadwick & Co..... 800
Barge Plymouth, Chadwick & Co..... 700
Vineyard Haven, wind S., moderate; smooth sea; clear:
Steamed east—
Steamer Harvey H. Brown..... 2,673
Tug Scranton, towing 3 barges, Chadwick..... 2,400
Steamed west, tug Mercury, towing 3 barges, Boston T. B. Co..... 2,400

40,458

In canal:		Around cape:	
Barges	2	Steamers	8
Tonnage, estimated	2,570	Tugs	8
		Barges	18
		Total	34
		Tonnage, estimated	40,458

JULY 18, 1916.

Passed east:
Lighter Cornelia, B. S. & G. Co..... 285
Barge Martin Horan, B. S. & G. Co..... 373
Barge Mary Horan, B. S. & G. Co..... 400
Passed west, lighter Cornelia..... 285

1,343

Canal is open for light barges, schooners, yachts and all small craft.

BOSTON.

Arrived:
Steamer Parthian from Philadelphia, Mer. & Min. T. Co..... 2,082
Steamer Nantucket from Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Bay View from Newport News, White Oak T. Co..... 1,399
Steamer Bunker Hill from New York, Eastern S. S. Co..... 4,779
Steamed:
Steamer Kershaw for Baltimore, Mer. & Min. T. Co..... 2,599
Steamer Massachusetts for New York, Eastern S. S. Co..... 4,779
Steamer Nacoochee for Savannah, Ocean S. S. Co..... 2,680
Steamer President Bunge (Br.) for New York.....
Steamer Norfolk for Philadelphia, Coastwise S. S. Co..... 3,521
Steamer Suffolk for Newport News, Coastwise S. S. Co..... 4,718
Tug Tamaqua—
Barge Ontelaunce, Reading R. R..... 739
Barge Tohickon, Reading R. R..... 739
Barge Richardson, Reading R. R..... 693
Tug Boxer, F. W. Munn..... 216
Tug Nottingham—
Barge L. & W. C. Co. No. 8, L. W. C. Co..... 955
Barge L. & W. C. Co. No. 11, L. W. C. Co..... 900
Barge L. & W. C. Co. No. 14, L. W. C. Co..... 900
Highland Light, wind 5 p. m., SW.; 20 miles; hazy; smooth sea:
Passed east, steamer Newton, N. E. Coal & C. Co..... 5,194

Chatham, wind 5 p. m., S.; moderate breeze; clear:
Passed east—
Tug Monocacy—
Barge Exeter, Reading R. R..... 1,780
Barge Temple, Reading R. R..... 963
Barge Manatawney, Reading R. R..... 721
Steamer Herman Winter, Eastern S. S. Co..... 2,625
Tug Calvert—
Barge Chemung, Chadwick..... 700
Barge Camden, Chadwick..... 700
Nobska, wind 5 p. m., SW.; light breeze; clear:
Passed east—
Steamer J. H. Devereux, N. E. C. & C. Co..... 1,618
Steamer North Land, Eastern S. S. Co..... 3,282

JULY 19, 1916.

Vineyard Haven:
Steamed east—
Tug C. P. Greenough—
Barge Birvabic, N. E. C. & C. Co..... 700
Barge Boston..... 1,300
Barge Lynn, N. E. C. & C. Co..... 1,300
Steamed west—
Tug Catawissa, towing 3 barges, Reading R. R..... 2,400
Tug Lykens, towing 3 barges, Reading R. R..... 2,400
Steamed east, tug Prudence, towing 2 barges, F. W. Munn..... 1,600

61,579

In canal:		Around cape:	
Lighters.....	2	Steamers.....	14
Barges.....	2	Tugs.....	9
		Barges.....	22
Total.....	4		
Tonnage, estimated.....	1,343	Total.....	45
		Tonnage, estimated.....	61,579

On July 19, there passed through the canal the following yachts:

Yacht Diana..... 751
Yacht Amarilla..... 35
Yacht Braemore..... 10
Yacht Senorita..... 10
Yacht Malvina..... 10
Yacht Old Glory III..... 10

826

JULY 20, 1916.

Passed west:
Schooner James Rothwell..... 498
Tug Petrel—
Barge Connelly Bros. Erie R. R..... 751
Barge Batic, Erie R. R..... 915
Barge S. T. Co. No. 2, S. T. Co..... 700
Tug Prudence, barge Varina..... 441
Passed east:
Barge Hauto, L. C. & N. Co..... 830
Barge Coaldale, L. C. & N. Co..... 831
Barge Allentown, L. C. & N. Co..... 842
Lighter Palmer, B. S. & G. Co..... 124

(In pencil:) Yachts now shown for July 20. 5,932

BOSTON.

Arrived:
Steamer Chippewa from Charleston, Clyde S. S. Co..... 2,696
Steamer Ontario from Baltimore, Mer. & Min. T. Co..... 3,099
Steamer Bunker Hill from New York, Eastern S. S. Co..... 4,779

Steamed:
- Steamer Parthian for Philadelphia, Mer. & Min. T. Co 2,082
- Steamer Nantucket for Baltimore, Mer. & Min. T. Co 2,599
- Steamer Bay View for Newport News, White Oak T. Co 1,399
- Steamer Malden for Baltimore, N. E. C. & C. Co 5,107
- Steamer Massachusetts for New York, Eastern S. S. Co 4,779
- Steamer Herman Winter for New York, Eastern S. S. Co 2,625
- Steamer Nacoochee for Savannah, Ocean S. S. Co 2,680

Highland Light, wind 5 p. m. SE., 12 miles; thick fog; smooth sea.
Vineyard Haven, wind E., moderate; foggy; smooth sea:
- Arrived—
  - Schooner B. T. Hazard 392
  - Schooner Palmetto (Br.) .....
- Arrived east—
  - Tug Swatara—
    - Barge Cocalico, Reading R. R 956
    - Barge Brookside, Reading R. R 841
    - Barge Preston, Reading R. R 855
  - Arrived west, tug Germantown, towing barges, Reading R. R 2,400

37,889

In canal:		Around cape:	
Tugs	2	Tugs	2
Barges	7	Barges	6
Lighters	1	Steamers	10
Schooners	1	Schooners	2
Total	11	Total	20
Tonnage, estimated	5,932	Tonnage, estimated	37,289

JULY 21, 1916.

Passed west, tug Pejepscot, towing steamer America 2,171

BOSTON.

Arrived:
- Steamer City of Atlanta from Savannah, Ocean S. S. Co 5,433
- Steamer Massachusetts from New York, Eastern S. S. Co 4,779
- Steamer J. H. Devereux from Norfolk, Met. Coal Co 1,618
- Steamer Gloucester from Baltimore, Mer. & Min. T. Co 2,541

Steamed:
- Steamer Bristol for Norfolk 257
- Steamer Bylayl for Norfolk .....
- Steamer Buenaventura for New York .....
- Steamer Harvey H. Brown for Sewalls Point 2,673
- Steamer Ontario for Norfolk, Mer. & Min. T. Co 3,099

Highland Light, wind 5 p. m. WSW., 30 miles; cloudy; smooth sea.
Vineyard Haven, wind S.; strong, rough sea; thick and rainy:
- Arrived—
  - East, steamer H. M. Whitney, Eastern S. S. Co 2,706
  - West, schooner Glendon (Br.) .....
  - East, tug Perth Amboy, towing 3 barges, Lehigh Valley 2,400
  - East, tug Prudence, towing 2 barges, F. W. Munn 1,600
  - West, tug Daniel Willard, towing 3 barges, J. B. King 2,400

29,506

In canal:		Around cape:	
Tugs	1	Steamers	10
Steamers	1	Tugs	3
Total	2	Barges	8
Tonnage, estimated	2,171	Schooners	1
		Total	22
		Tonnage, estimated	29,506

JULY 23, 1916.

Passed west:

Steamer J. H. Devereux, Met. Coal Co	1,618
Lighter Cornelia, B. S. & G. Co	285
Tug Cheektowaga, towing 3 barges, Lehigh Valley R. R. Co	2,200
Barge Wilmington, Northern Coal Co	1,200
Barge Montauk, Northern Coal Co	800
Schooner Ann J. Trainer	426
East, schooner Addie P. McFadden	251
	6,780

BOSTON.

Arrived:

Steamer City of Augusta from Savannah, Ocean S. S. Co	2,869
Steamer Howard from Norfolk, Mer. & Min. T. Co	3,581
Steamer Persian from Philadelphia, Mer. & Min. T. Co	2,677
Steamer Massachusetts from New York, Eastern S. S. Co	4,779

Steamed:

Steamer City of Atlanta for Savannah, Ocean S. S. Co	5,433
Steamer Grecian for Philadelphia, Mer. & Min. T. Co	2,827
Steamer Bunker Hill for New York, Eastern S. S. Co	4,779
Tug Swatara—	
Barge Cacoosing, Reading R. R	721
Barge Marriam, Reading R. R	855
Barge Silver Brook, Reading R. R	904

Vineyard Haven, wind S. W., fresh; rough sea; thick and rainy:

Arrived west, steamer Bay View, White Oak Coal Co	1,399
Arrived east—	
Schooner Senator Saulsbury	107
Schooner Abenaki	176
Schooner Earl V. S. (Br.)	
Schooner Lina (Br.)	
Schooner Lavolta	204
Schooner Melissa Trask	236
Tug Albert J. Stone—	
Barge Edgewater, Erie R. R	800
Barge Passaic, Erie R. R	900
Barge Albany, Erie R. R	659
Tug Lehigh—	
Barge 795, Lehigh Valley R. R	400
Barge 700, Lehigh Valley R. R	934
Barge 783, Lehigh Valley R. R	923
Tug Perth Amboy—	
Barge 702, Lehigh Valley R. R	934
Barge 741, Lehigh Valley R. R	800
Barge 742, Lehigh Valley R. R	800
Tug Paoli—	
Barge Oxford, Susquehanna Coal Co	836
Barge Upton, Susquehanna Coal Co	843
Barge Haverford, Susquehanna Coal Co	778
Tug Ontario—	
Barge Forest Belle, N. Y. O. & W. R. R	1,333
Barge Pilgrim, N. Y. O. & W. R. R	1,300
Barge Cadosia, N. Y. O. & W. R. R	756
Tug Eureka—	
Barge Fall River, Staples T. Co	1,759
Barge Havana, Staples T. Co	1,617
Barge Tipton, Staples T. Co	830
Tug C. P. Greenough—	
Barge Helen, N. E. C. & C. Co	1,285
Barge Beattie, N. E. C. & C. Co	1,117
Barge Emilie, N. E. C. & C. Co	1,069
	52,120

In canal:		Around cape:	
Steamers	1	Steamers	8
Lighters	1	Tugs	8
Tugs	1	Barges	24
Barges	5	Schooners	6
Schooners	2		46
	10	Tonnage, estimated	52,120
Tonnage estimated	6,780		

JULY 24, 1916.

Passed west, schooner Osaiah K. Stetson 313

BOSTON.

Arrived:
- Steamer Brandon from Baltimore 1,062
- Steamer Juniata from Norfolk, Mer. & Min. T. Co 3,465

Steamed:
- Steamer City of Madrid for New York .....
- Steamer Howard for Baltimore, Mer. & Min. T. Co 3,581
- Steamer City of Augusta for Savannah, Ocean S. S. Co 2,869

Arrived:
- Steamer George Hawley from Norfolk, B.-Va. T. Co 2,549
- Steamer Bunker Hill from New York, Eastern S. S. Co 4,779

Steamed:
- Steamer Afghan Prince (Br.) for New York 4,923
- Steamer Chippewa for Jacksonville, Clyde S. S. Co 2,696
- Steamer Aspinet (Br.) for New York 126
- Steamer Middlesex for Norfolk, Coastwise T. Co 4,727
- Steamer Brilliant, barge No. 26, Standard T. Co 1,000
  - Tug Standard—
    - Barge 124, Standard T. Co 1,000
    - Barge 6, Standard T. Co 1,000
    - Barge 123, Standard T. Co 1,000
- Steamer Massachusetts for New York, Eastern S. S. Co 4,779

Highland Light, wind, 5 p. m., SW.; 20 miles; foggy; smooth sea:
- Passed west, steamer Northland, Eastern S. S. Co 3,282

Chatham, wind, 5 p. m., SW.; moderate breeze; thick fog:
- Passed east—
  - Tug Swatara—
    - Barge Bethayres, Reading R. R 955
    - Barge Glendower, Reading R. R 855
    - Barge Thomaston, Reading R. R 693

Vineyard Haven, wind, SW.; fresh; choppy sea; thick and rainy:
- Arrived—
  - West—
    - Schooner Chas. C. Lister 280
    - Schooner Harry W. Haynes 295
    - Schooner Alcaca (Br.) .....
  - East, tug Cumberland—
    - Barge No. 7, Con. Coal Co 898
    - Barge No. 18, Con. Coal Co 936
  - West, tug Honeybrook—
    - Barge No. 16, L. & W. Coal Co 800
    - Barge No. 12, L. & W. Coal Co 800
  - East, tug Georges Creek—
    - Barge No. 21, Con. Coal Co 905
    - Barge No. 24, Con. Coal Co 1,566
  - East, tug Covington, towing 2 barges, Seaboard T. Co 1,600

In canal:		Around cape:	
Schooners	1	Steamers	14
Tonnage	313	Tugs	6
		Barges	15
		Schooners	3
			38
		Tonnage, estimated	53,421

JULY 25, 1916.

No report.

BOSTON.

Arrived:
- Steamer Nantucket from Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Massachusetts from New York, Eastern S. S. Co. 4,779

Steamed:
- Steamer Persian for Philadelphia, Mer. & Min. T. Co. 2,677
- Steamer Juniata for Norfolk, Mer. & Min. T. Co. 3,465
- Steamer Hampden for Baltimore, Coastwise S. S. Co. 4,725
- Steamer Brandon for Lamberts Point 1,062
- Steamer Herman Winter for New York, Eastern S. S. Co. 2,625
- Steamer Bunker Hill for New York, Eastern S. S. Co. 4,779

Highland Light, wind 5 p. m. SW.; 25 miles; thick fog; smooth sea.

Nobska, 4.20 p. m. wind SW.; 15 miles; dense fog:

Passed east—
- Tug Gettysburg—
  - Barge Enterprise, Reading 901
  - Barge Henry Clay, Reading 841
  - Barge Marion, Reading 954
- Schooner Lyman M. Law 1,300

Vineyard Haven:

Arrived east—
- Tug Piedmont, towing 3 barges, Con. Coal Co 2,700
- Tug Catawissa, towing 3 barges, Reading 2,400
- Tug Lykens, towing 3 barges, Reading 2,400

Around cape:
- Steamers 7
- Tugs 4
- Barges 12
- Schooners 1

24

Tonnage, estimated 38,207

There are 15 tugs and 41 barges, also a fleet of schooners, in the Vineyard waiting for the fog to lift.

JULY 26, 1916.

Passed east:
- Lighter Seabury 200
- Lighter Richmond 200
- Lighter Raymond 200
- Tug J. H. Chandler, barge Ruth 435
- Tug John A. Hughes, barge Baltimore 369
- Tug Gettysburg, towing 3 barges, Reading R. R. 2,696
- Steamer Sterling 149
- Steamer Annie L. Wilcox 149

Passed west:
- Lighter Cornelia, B. S. & G. Co. 281
- Schooner Waltham 82

4,561

BOSTON.

Arrived:
- Steamer Arlington from Norfolk, N. E. C. & C. Co. 2,431
- Steamer Kershaw from Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Quantico from Philadelphia, Mer. & Min. T. Co. 2,676
- Steamer Bunker Hill from New York, Eastern S. S. Co. 4,779
- Steamer H. M. Whitney from New York, Eastern S. S. Co. 2,706
- Steamer Bristol from Norfolk 257

Steamed:
- Steamer Arlington for Lamberts Point, N. E. C. & C. Co. 2,431
- Steamer Nantucket for Norfolk, Mer. & Min. T. Co. 2,599
- Steamer Geo. Hawley for Sewalls Point, B. & Va. T. Co. 2,549
- Steamer Juan (Nor.) for Norfolk 1,493
- Steamer Massachusetts for New York, Eastern S. S. Co. 4,779

Highland Light, 5 p. m., wind 15 miles; foggy; smooth sea.
Nobska, wind NW.; 8 miles; light fog.
Vineyard Haven, wind SW.; choppy sea; foggy:
Arrived east—
Schooner Emma S. Briggs 294
Tug Boswell, towing 3 barges, N. E. C. & C. Co 2,100
Tug Gervolia, towing 2 barges, N. E. C. & C. Co 2,100
Tug S. T. Co. No. 2, towing 2 barges, S. T. Co 2,000
Tug Western, towing 3 barges, N. Y., O. & W 2,400
Steamed west—
Tug Nottingham, towing 3 barges, L. & W. C. Co 2,100
Sailed east—
Schooner Marrie Saunders 279
Schooner Nova (Br.) 191
40,763

In canal:

Lighters	4
Tugs	3
Barges	5
Steamers	2
Schooners	1
	15
Tonnage, estimated	4,561

Around cape:

Steamers	11
Tugs	5
Barges	13
Schooners	3
	32
Tonnage, estimated	40,763

JULY 27, 1916.

Passed east:
Tug May—
Barge Calvin, Pettinos Bros 415
Barge Elizabeth, Pettinos Bros 440
Schooner Thos. H. Brice 48
903

BOSTON.

Arrived:
Steamer Gloucester, from Norfolk, Mer. & Min. T. Co 2,541
Steamer Katahdin, from Charleston, Clyde S. S. Co 2,691
Steamer Massachusetts, from New York, Eastern S. S. Co 4,779
Tug Plymouth—
Barge L. & W. No. 5, L. & W. C. Co 700
Barge L. & W. No. 7, L. & W. C. Co 700
Barge L. & W. No. 9, L. & W. C. Co 700
Steamed:
Steamer Suffolk, for Norfolk, Coastwise S. S. Co 4,718
Steamer Malden, for Norfolk, N. E. C. & C. Co 5,107
Steamer Quantico, for Philadelphia, Mer. & Min. T. Co 2,676
Steamer Kershaw, for Norfolk, Mer. & Min. T. Co 2,599
Steamer H. M. Whitney, for New York, Eastern S. S. Co 2,706
Steamer Bunker Hill, for New York, Eastern S. S. Co 4,779
Highland Light, 5 p. m., wind NE.; 15 miles; dense fog; smooth sea.
Nobska, wind S.; 5 miles; dense fog:
Passed east—
Steamer Bylayl .....
Tug S. T. Co. No. 1, barge 57, S. T. Co 1,000
Tug Concord—
Barge Chatham, Staples T. Co 1,812
Barge Greenwood, Staples T. Co 967
Tug F. E. Richards, towing 3 barges, R. & R. L. Co 2,400
Passed west—
Tug Monocacy—
Barge Bear Ridge, Reading R. R 910
Barge Oley, Reading R. R 1,780
Barge Paxtang, Reading R. R 954
Passed east, steamer Edward Pierce, Crowell & Thurlow 4,387

Vineyard Haven, wind SW.; moderate; smooth sea; thick fog:

Arrived east—	
Schooner Priscilla (Br.)	120
Tug Edgar F. Luckenbach, barge Solitaire, Luckenbach S. S. Co	1,515
United States Quartermaster tug Capt. T. W. Morrison	128
Arrived west, tug Swatara, towing 3 barges, Reading R. R	2,500
	53,074

In canal:		Around cape:	
Tugs	1	Tugs	8
Barges	2	Barges	16
Schooners	1	Schooners	1
	4	Steamers	11
			36
Tonnage, estimated	903	Tonnage, estimated	53,074

News item: Boston, July 27.—About 1,000 tons of coal has been recovered from steamer Wm. Chisholm which sank in the Cape Cod Canal while on passage from Newport News for Boston. The condition of the steamer is precarious; the bottom has scoured out from under the vessel, and at the present only about one-third of the length of keel on bottom; it is feared that the wreck will be complete, as owing to the strong current running through the canal successful wrecking operations are almost impossible.

JULY 28, 1916.

Passed east:	
Barge Irene, N. E. C. & C. Co	1,206
Barge Remus, Staples T. Co	531
Barge Bristol, L. C. & N. Co	500
Lighter Cornelia, B. S. & G. Co	281
Passed west:	
Lighter Cornelia, B. S. & G. Co	281
Lighter Palmer, B. S. & G. Co	124
Schooner Edith McIntyre	160
Tug John A. Hughes, barge Satilla	944
	4,027

BOSTON.

Arrived:	
Steamer Ontario, from Baltimore, Mer. & Min. T. Co	3,099
Steamer Grecian, from Philadelphia, Mer. & Min. T. Co	2,827
Steamer H. Winter, from New York, Eastern S. S. Co	2,625
Tug Gettysburg—	
Barge Tamenend, Reading R. R	721
Barge Franklin, Reading R. R	910
Barge Suffolk, Reading R. R	855
Steamer Bunker Hill, from New York, Eastern S. S. Co	4,779
Steamed:	
Steamer Gloucester, for Norfolk, Mer. & Min. T. Co	2,541
Steamer M. E. Harper, for New York, Shawmut S. S. Co	2,294
Steamer Christian Bros. (Nor.), for New York	4,306
Steamer Massachusetts, for New York, Eastern S. S. Co	4,779
Tug A. J. Stone—	
Barge Pittson, Erie R. R	800
Barge Scranton, Erie R. R	400
Barge Troy, Erie R. R	800
Tug Gettysburg—	
Barge Barry, Reading R. R	954
Barge Macungie, Reading R. R	956
Barge Rutherford, Reading R. R	955
Tug North America—	
Barge Apere, Reading R. R	698
Barge N. T. Co. No. 2, Reading R. R	700
Barge Easton, Reading R. R	531
Tug Murrell—	
Barge Lynn, N. E. C. & C. Co	1,159
Barge Boston, N. E. C. & C. Co	1,159
Barge Sweetser Linthicum	800

Highland Light, wind 5 p. m., ENE.; 5 miles; foggy; smooth sea.
Chatham, 5 p. m., wind NE.; fresh breeze; cloudy; indications of fog:
Passed east—
Steamer North Star, Eastern S. S. Co 3,159
Steamer Harvey Brown 2,673
Tug Boxer—
Barge Lincoln, F. W. Munn 855
Barge Tulpehocken, F. W. Munn 721
Tug International—
Barge Conewago, Reading R. R 956
Barge Langhorne, Reading R. R 955
Vineyard Haven, wind NE.; fresh; choppy sea; clear.
Sailed west, schooner Flo. F. Mader (Br.) 116
Sailed east—
Schooner Manchester 303
Schooner Gladys E. Whidden (Br.) 214
Arrived, tug Sea King—
Barge Harvard, N. E. C. & C. Co 1,603
Barge Flora, N. E. C. & C. Co 865
Passed west—
Schooner Brigadier 310
Schooner Susan A. Pickering 336
Tug Wyoming, towing 3 barges, Lehigh Valley 2,400

55,114

In canal:		Around cape:	
Barges	4	Steamers	9
Lighters	3	Tugs	9
Schooners	1	Barges	24
Tug	1	Schooners	5
	9		47
Tonnage, estimated	4,027	Tonnage, estimated	55,114

JULY 30, 1916.

Passed west:
Steamer Massachusetts, Eastern S. S. Co 4,779
Steamer Geo. Hudson 149
Steamer B. F. Macomber 180
Schooner Annie P. Chase, Eastern Mfg. Co 256
Schooner J. R. Bodwell 224
Schooner Chas. H. Trickey 281
Tug Perth Amboy—
Barge L. V. 782, L. V. R. R 924
Barge L. V. 765, L. V. R. R 910
Passed east:
Steamer Bunker Hill, Eastern S. S. Co 4,779
Schooner Nat Meador 278
Schooner J. Arthur Lord 212
Schooner Susie P. Oliver 272

13,244

JULY 29.

BOSTON.

Arrived:
Steamer J. H. Devereux from Norfolk, Met. Coal Co 1,618
Steamer Middlesex from Norfolk, Coastwise T. Co 4,727
Steamer Bay State from Sewalls Point, White Oak T. Co 1,245
Steamer City of Atlanta from Savannah, Ocean S. S. Co 5,433
Steamer Juniata from Norfolk, M. & M 3,465
Steamer Persian from Philadelphia, M. & M 2,677
Steamer Coastwise from Baltimore, Coastwise S. S. Co 4,015
Tug Honeybrook—
Barge L. & W. 4, L. & W. Coal Co 650
Barge L. & W. 10, L. & W. Coal Co 900
Barge L. & W. 15, L. & W. Coal Co 900

Arrived—Continued.
Tug T. J. Scully—
Barge Annie H. Smith, Ed. F. Luckenbach 1,487
Barge Carrie Clark, Ed. F. Luckenbach 1,298
Barge Old Dominion, Ed. F. Luckenbach 1,802
Barge City of Washington, Ed. F. Luckenbach 2,410
Tug Clincher—
Barge Nanticoke, Dougherty 1,140
Barge Salem, Shawmut S. S. Co 1,600
Tug Richmond, barge Kennebec, Seaboard T. Co 2,048
Tug Essex—
Barge Marion, Erie R. R. Co 600
Barge Dunmere, Erie R. R 600
Barge Binghampton, Erie R. R 600
Tug Sea King—
Barge Harvard, N. E. C. & C. Co 1,286
Barge Flora, N. E. C. & C. Co 865
Tug Chandler—
Barge Henry Endicott 866
Barge Horace A. Allyn, Penn Gas Coal Co 859
Tug R. F. Young—
Barge Sylvester, N. Y. & B. T. Co 382
Barge Electra, N. Y. & B. T. Co 400
Barge Ed. E. Mulqueen, N. Y. & B. T. Co 400
Tug Chas. T. Gallagher, barge Highview ....
Steamed, 30th:
Steamer Cretic for New York ....
Steamer Nacoochee for Savannah, Ocean S. S. Co 2,680
Steamer Newton for Lamberts Point, N. E. C. & C. Co 5,194
Tug Neptune—
Barge Portsmouth, Shawmut 1,500
Barge Providence, Shawmut 1,500
Tug E. F. Luckenbach—
Barge W. F. Babcock, E. F. Luckenbach 2,128
Barge Josephus, E. F. Luckenbach 1,406
Tug Gwalia—
Barge Alice, N. E. C. & C. Co 640
Barge Clara, N. E. C. & C. Co 828
Barge Biwabik, N. E. C. & C. Co 640
Tug Boxer—
Barge Bethayres, Reading 955
Barge Cocalico, Reading 956
Barge Franklin, Reading 910
Tug Concord—
Barge Baltimore, Dougherty 510
Barge Gibson, Staples 839
Barge R. W. McDonald ....
Tug M. Mitchell, barge Annie Smith ....
Sailed 29th: Schooner L. A. Plummer 394

JULY 30, 1916.

Vineyard Haven, wind SW.; fresh; choppy sea; hazy:
Arrived—
Tug Lykens—
Barge Manatawney, Reading 739
Barge Skippack, Reading 739
Barge Brookside, Reading 841
Tug E. F. Luckenbach, towing 2 barges, Luckenbach ....
Passed eastbound—
Tug Nottingham, towing 3 barges, L. & W. Coal Co 2,700
Tug Daniel Willard, towing 2 barges, L. & W. Coal Co 1,200
Sailed—
Schooner Winchester 303
Schooner Emma S. Briggs 294
Schooner Priscilla 75
Schooner Peter C. Schultz 437

72,681

In canal:		Around cape:	
Steamers	4	Steamers	10
Schooners	6	Tugs	18
Tug	1	Barges	43
Barges	2	Schooners	5
	13		76
Estimated tonnage	13,244	Estimated tonnage	72,681

JULY 31, 1916.

Passed east:
- Steamer Massachusetts, Eastern S. S. Co. 4,779
- Steamer B. F. Macomber 180
- Steamer George Hudson 149
- Tug John Hughes, barge Caddo, Texas Oil Co 1,000
- Tug Petrel, towing 3 barges, Erie R. R 2,400
- Schooner Lizzie J. Call 206

Passed west:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Lighter Cornelia, B. S. & G. Co 281
- Schooner Abbie Keast (Br.) 200

13,974

BOSTON.

Arrived:
- Steamer Howard from Baltimore, Mer. & Min. T. Co 3,581
- Steamer Brandon from Lamberts Point 1,062
- Tug Valley Forge—
  - Barge Monitor, Reading R. R 955
  - Barge Moline, Reading R. R 954
  - Barge Indian Ridge, Reading R. R 910
- Tug Conestoga—
  - Barge Spring, Reading R. R 1,780
  - Barge Robesonia, Reading R. R 955
  - Barge Neshaminy, Reading R. R 721
- Tug Standard—
  - Barge No. 5, Standard T. Co 1,000
  - Barge No. 6, Standard T. Co 1,000
  - Barge No. 124, Standard T. Co 1,000

Steamed:
- Steamer Juniata for Baltimore, Mer. & Min. T. Co 3,465
- Steamer Edward Pierce, for Sewalls Point, Crowell & Thurlow 4,387
- Steamer Harvey H. Brown from Sewalls Point 2,673
- Tug International—
  - Barge Glendower, Reading R. R 855
  - Barge Preston, Reading R. R 855
  - Barge Thomaston, Reading R. R 693
- Steamer Middlesex, for Norfolk, Coastwise T. Co 4,727

Highland Light, wind 5 p. m. WSW.; 7 miles; very hazy; smooth sea.

Nobska, wind 5 p. m. W.; 13 miles; smoky:
- Passed east, Tug Lenape—
  - Barge Cleona, Reading 956
  - Barge Maple Hill, Reading 911
  - Ontelaunce, Reading 739
- Passed west, tug Catawissa—
  - Barge Temple, Reading 963
  - Barge Kimberton, Reading 955
  - Barge Manatawny, Reading 721

Vineyard Haven, wind variable; light, smooth sea; hazy.

Arrived east:
- Schooner Jesse Hart 255
- Schooner Annie B. Mitchell 463
- Schooner Nellie Grant 19
- Schooner Latooka (Br.) 150
- Schooner Fannie & Fay 233
- Schooner Leonard C. (Br.) 150
- Schooner Hattie H. Barbour 301

Arrived east—Continued.
- Tug Savage—
  - Barge 10, Con. Coal Co 897
  - Barge 24, Con. Coal Co 1,566
- Schooner Dean E. Brown 719
- Tug Underwriter—
  - Towing schooner 200
  - Towing barge 600

In canal:		Around cape:	
Steamers	4	Steamers	6
Tugs	2	Tugs	7
Barges	4	Barges	21
Schooner	2	Schooners	9
Lighter	1		
	13		43
Tonnage, estimated	13,974	Tonnage, estimated	42,371

AUGUST 1, 1916.

Passed east:
- Steamer Bunker Hill, Eastern S. S. Co 4,779
- Tug Cheektowaga—
  - Barge 767, Lehigh Valley R. R 600
  - Barge 788, Lehigh Valley R. R 600
  - Barge 791, Lehigh Valley R. R 600
- Lighter Cornelia, Boston S. & G. Co 281
- Barge Nesquehoning, L. C. & N. Co 967
- Barge Rahn, L. C. & N. Co 932
- Schooner Alice S. Wentworth 68

Passed west:
- Steamer Massachusetts, Eastern S. S. Co 4,779
- Tug Richard F. Young, towing 4 barges, N. Y. & B. T. Co 2,400
- Tug May, towing 2 barges, Pettinos Bros 1,400
- Tug Neptune, towing Lighter No. 1 400
- Tug Chas. Gallagher, towing yawl 16
- Barge Chatham 1,812

19,634

BOSTON.

Arrived:
- Steamer George Hawley, from Lamberts Point, B. Va. T. Co 2,549
- Steamer Persian, from Philadelphia, M. & M. T. Co 2,677
- Steamer Kershaw, from Norfolk, M. & M. T. Co 2,599
- Tug Germantown—
  - Barge Tabor, Reading 963
  - Barge Logan, Reading 955
  - Barge Hammond, Reading 693

Steamed:
- Steamer Howard, for Baltimore, M. & M. T. Co 3,581
- Steamer City of Atlanta, for Savannah, Ocean S. S. Co 5,433
- Steamer Tunisie (Belg.), for New York .....
- Tug Honeybrook—
  - Barge 57, L. & W. C. Co 700
  - Barge 9, L. & W. C. Co 700
- Tug Plymouth—
  - Barge 3, L. & W. C. Co 900
  - Barge 2, L. & W. C. Co 900
  - Barge Wilkesbarre, L. & W. C. Co 1,200
- Tug Standard, barge 57, Standard T. Co 1,000
- Steamer Coastwise, for Newport News, Coastwise S. S. Co 4,015
- Steamer Leonatas (Br.), for Newport News .....
- Steamer Brandon, for Baltimore 1,062

Highland light, wind 5 p. m. NE.; 3 miles; clear; smooth sea:
- Passed east; tug Monocacy—
  - Barge Mingo, Reading 954
  - Barge Tohickon, Reading 739
  - Barge Richardson, Reading 693

Chatham, wind 5 p. m. N.; light breeze; clear:
Passed west—
Tug Patience—
Barge Geo. R. Stetson, F. W. Munn 675
Barge Hampshire, F. W. Munn 800
Barge Larimer, F. W. Munn 600
Tug Western—
Barge Metacomet, N. Y. O. & W. R. R 800
Barge Sidney, N. Y. O. & W. R. R 745
Barge Smyrna, N. Y. O. & W. R. R 741
Steamer Bylayl .....
Vineyard Haven, wind NE.; fresh breeze; clear; choppy sea:
Arrived east bound—
Schooner Hattie Dunn 435
Schooner Colin C. Baker 410
Schooner Abbie S. Walker 190
Schooner Genevieve (Br.) 144
Schooner Clara A. Donnell 1,177
West bound—
Schooner Rosalie Belleveau (Br.) 239
Schooner Winnegance 257
Schooner Anne Lord 287
Schooner Percy B. (Br.) .....
Schooner Harriet C. Whitehead 222
Steamer Middlesex, Coastwise S. S. Co 4,727

In canal:		Around cape:	
Steamers	2	Steamers	11
Tugs	5	Tugs	7
Barges	12	Barges	18
Yawl	1	Schooners	10
Schooner	1		
Lighters	2	Total	46
Total	23	Tonnage, estimated	44,762
Tonnage, estimated	19,634		

AUGUST 3, 1916.

Passed west:
Steamer Massachusetts, Eastern S. S. Co 4,779
Steamer Devereux, Met. Coal Co 1,618
Lighter Cornelia, B. S. & G. Co 281
Schooner Emma W. Day 96
Schooner Annie Gus 99
Schooner William D. Hilton 324
Tug Cheektowaga, towing 3 barges, Lehigh Valley 2,400
Passed east:
Steamer Bunker Hill, Eastern S. S. Co 4,779
Schooner John B. Norris 49
Schooner Fannie & Fay 233
Schooner Carrie A. Buchman 287
Schooner C. B. Clark 194
Lighter Cornelia, B. S. & G. Co 281
Tug Prudence, towing 2 barges, F. W. Munn 1,600
17,020

BOSTON.

Arrived:
Steamer Ontario from Norfolk, Mer. & Min 3,099
Steamer City of Augusta from Savannah, Ocean S. S. Co 2,869
Steamer Chippewa from Charlestown, Clyde S. S. Co 2,696
Steamer Bristol from Norfolk 257
Tug Waltham—
Barge Mount Hope, Staples Trans. Co 1,801
Barge Braddock, Staples Trans. Co 678

Arrived—Continued.
Tug Wyoming—
Barge No. 740, Lehigh Valley..... 800
Barge No. 785, Lehigh Valley..... 700
Tug Triton—
Barge Pottsville, Seaboard T. Co..... 1,283
Barge Occidental..... 1,532
Steamed:
Steamer Benguela (Br.) for New York..... 4,545
Steamer Quantico for Philadelphia, Mer. & Min. T. Co..... 2,676
Steamer Nantucket for Norfolk, Mer. & Min. T. Co..... 2,599
Steamer Malden for Baltimore, N. E. C. & C. Co..... 5,107
Steamer Highcliff (Br.) for New York.....
Steamer Herman Winter for New York, Eastern S. S. Co..... 2,625
Steamer Ontario for Baltimore, Eastern S. S. Co..... 3,099
Tug Germantown—
Barge Conewago, Reading R. R..... 956
Barge Suffolk, Reading R. R..... 855
Barge Beechwood, Reading R. R..... 841
Tug Lanape—
Barge Lincoln, Reading R. R..... 855
Barge Maple Hill, Reading R. R..... 911
Barge Neshaminy, Reading R. R..... 725
Highland Light, 5 p. m., wind SW., 17 miles; cloudy; smooth sea.
Chatham, 5 p. m., wind SW., 17 miles; cloudy; smooth sea:
Passed west, tug Lehigh—
Barge No. 706, Legigh Valley..... 934
Barge No. 780, Lehigh Valley..... 926
Barge No. 766, Lehigh Valley..... 600
Nobska, wind SW., 15 miles; clear:
Passed east, tug Gettysburg—
Barge Yardley, Reading R. R..... 963
Barge Bear Ridge, Reading R. R..... 910
Barge Oley, Reading R. R..... 1,780
Passed west—
Tug Petrel—
Barge Albany, Erie R. R..... 659
Barge Edgewater, Erie R. R..... 800
Barge Passaic, Erie R. R..... 900
Tug Standard—
Barge S. T. Co. No. 5, Standard T. Co..... 1,000
Barge S. T. Co. No. 6, Standard T. Co..... 1,000
Barge S. T. Co. No. 124, Standard T. Co..... 1,000
Tug Boswell—
Barge Hattie, N. E. C. & C. Co..... 1,286
Barge Providence, N. E. C. & C. Co..... 1,200
Vineyard Haven, wind SW., moderate; clear; smooth sea:
Arrived:
West, schooner S. A. Phimmer..... 394
East, tug W. B. Kune, towing 2 barges..... 1,600

57,457

In canal:		Around cape:	
Steamers	3	Steamers	11
Tugs	2	Tugs	11
Barges	5	Barges	28
Lighters	2	Schooner	1
Schooners	7		
Total	19	Total	51
Tonnage, estimated	17,020	Tonnage, estimated	57,457

AUGUST 4.

Passed east:	
Tug A. J. Stone, towing 3 barges, Erie R. R.	2,400
Tug Mercury, towing 3 barges, B. T. B. Co.	2,700
Barge Kennelley Bros.	800
Passed west:	
Schooner B. H. Warford	203
Schooner Lucille	200
Schooner Emma McAdam	166
Passed east and west, Steamship Massachusetts, Eastern S. S.	9,558
	16,027

BOSTON.

Arrived:	
Steamer Suffolk, from Norfolk, Coastwise Co.	4,718
Steamer Gloucester, from Baltimore, M. & M. Co.	2,541
Steamer H. M. Whitney, Eastern S. S Co.	2,706
Tug Gettysburg—	
Barge Rear Ridge, Reading R. R.	910
Barge Yardley, Reading R. R.	963
Barge Oley, Reading R. R.	1,780
Tug Chas. P. Greenough—	
Barge Helen, N. E. C. & C.	1,285
Barge Beattie, N. E. C. & C.	1,117
Tug W. B. Keene—	
Barge Savannah, So. Trans. Co.	1,000
Barge Altamaha	944
Cleared, Steamship City of Augusta, for Savannah	2,869
Steamed:	
Steamship Ontario, for Newport News, M. & M.	3,099
Steamship Geo. Hawley, for Sewalls Point, Va. Trans. Co.	2,549
Steamship Hilton, for New York, A. H. Bull	3,102
Tug Triton, Barge Kennebec, Sea. Trans.	2,048
Highland Light, wind 5 p. m., SW., 20 miles; hazy; smooth sea.	
Chatham, 5 p. m., wind S., light breeze; hazy:	
Passed—	
Steamship North Star, from Portland, Eastern S. S. Co.	3,169
Tug Tacony—	
Barge Radnor, Sus. Coal Co.	678
Barge Strafford, Sus. Coal Co.	678
Barge Nanticoke, Dougherty	1,100
Tug Ontario—	
Barge Pilgrim, N. Y. O. & W. R. R.	1,400
Barge Cadosia, N. Y. O. & W. R. R.	756
Vineyard Haven, wind SW., moderate; smooth sea; clear:	
Arrived and sailed—	
Schooner Seth M. Todd	194
Schooner Victoria	38
Schooner Elma (Br.)	338
Schooner Wm. Booth	545
Schooner Geo. E. Klinck	560
Schooner Crescent	465
Sailed, Schooner Leora M. Thurlow	213
	41,755

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	2	Tugs	6
Barges	7	Barges	13
Schooners	3	Schooners	7
Total	14	Total	34
Estimated tonnage	16,027	Estimated tonnage	41,755

AUGUST 6.

Passed east:	
Steamer Massachusetts, Eastern S. S. Co.	4,779
Tug R. F. Young, towing 3 barges, B. & N. Y. T. Co.	2,100
Schooner Sarah & Lucy	252
Passed west:	
Steamship Bunker Hill, Eastern S. S. Co.	4,779
Schooner Sallie E. Ludlam	225
Schooner Maggie Todd	136
Schooner J. Howell Leeds	414
	12,685

BOSTON.

Steamship Howard for Norfolk, M. & M.	3,581
Steamship Middlesex, Norfolk, Coastwise Trans.	4,727
Steamship Persian, Philadelphia, M. & M.	2,677
Steamship Coastwise, for Sewalls Point, Coastwise Trans.	4,015
Steamed, 5th:	
Steamship Buffalo (Br.), via New York.	
Steamship Grecian, for Philadelphia, M. & M.	2,827
Steamship Gloucester, for Norfolk, M. & M.	2,541
Steamship Suffolk, for Norfolk, Coastwise	4,718
Steamed, 6th:	
Tug Chas. P. Greenough—	
Barge Annie, N. E. C. & C. Co.	1,098
Barge Harvard, N. E. C. & C. Co.	1,603
Barge Salem	1,603
Vineyard Haven, wind variable; light breeze; foggy; smooth sea:	
Passed—	
Tug Savage, with 3 barges, Con. Coal Co.	2,400
Tug Waltham—	
Barge Mount Hope, Staples.	1,801
Barge Tobyhanna, D. L. & W.	800
Barge Henry Endicott	866
Tug Clincher—	
Barge Chemung, L. C. & N. Co.	600
Barge Plymouth	600
Barge Rahm, L. C. & N. Co.	932
Sailed—	
Schooner Emily F. Northam	332
Schoonr Geo. E. Klinck.	560
Schooner William Booth.	545
	38,826

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	1	Tugs	4
Barges	3	Barges	12
Schooners	4	Schooners	3
Total	10	Total	27
Estimated tonnage	12,685	Estimated tonnage	38,826

AUGUST 7.

Passed east:	
Steamship Bunker Hill, Eastern S. S. Co.	4,779
Tug Three Friends, barge Newark	313
Barge Ida Woods, James Hughes	524
Rose M. Feeney, James Hughes	515
Katherine Horan, James Hughes	481
Passed west:	
Steamship Massachusetts, Eastern S. S. Co.	4,779
Tug R. F. Young, with 3 barges	2,100
Schooner Moonlight	198
	13,689

BOSTON.

Arrived, 7th:
- Steamship Nacoochee, Savannah, Ocean S. S. Co. 2,680
- Steamship Harvey H. Brown, Norfolk 2,673
- Steamship Bylayl, Norfolk
- Steamship Brandon, Baltimore 2,431
- Bark Windrush, New York 1,531
- Tug Plymouth—
  - Barge L. & W. No. 12, L. & W. Coal Co. 900
  - Barge L. & W. No. 1, L & W. Coal Co. 900
- Tug International—
  - Barge Macungie, Reading 956
  - Barge Skippack, Reading 739
- Tug Lykens—
  - Barge Cacoosing, Reading 721
  - Barge Silver Brook, Reading 904
  - Barge Merriam, Reading 855
- Tug Covington—
  - Barge Indiana, Sea Trans. Co. 1,626
  - Barge Ohio, Sea Trans. Co. 1,629

Steamed:
- Steamship Broistol, Norfolk 284
- Steamship Howard, Baltimore, M. & M. 3,581
- Steamship Coastwise, Cuba, Coastwise T. Co. 4,015
- Tug Lykens—
  - Barge Ontelaunce, Reading 739
  - Barge Pennypack, Reading 739
- Steamship Middlesex, Norfolk, Coastwise T. Co. 4,727

Highland Light, wind 5 p. m., SW., 25 miles; hazy; smooth sea.

Chatham, August 7, 5 p. m., wind SSW., fresh; thick fog:
- Anchored off Handkerchief noon steamship Juniata, Baltimore, for Boston in fog, M. & M. 3,465

Vineyard Haven, wind SW., moderate; cloudy; smooth sea:
- Arrived—
  - Schooner Gladys B. Smith (Br.)
  - Schooner Centennial 115
  - Schooner L. L. Hamlin 147
  - Tug Chas. W. Parker, jr., barge John H. Winstead, Eastern T. Co. 841
  - Tug Murrell, barge Lynn, Shawmut S. S. Co. 1,500
  - Tug Gwalia, 3 barges, Boston T. B. Co. 2,400
  - Tug Standard II, 2 barges, S. O. Co. 1,800
  - Tug Honeybrook—
    - No. 2, L. & W. Coal Co. 900
    - No. 5, L. & W. Coal Co. 600
    - No. 10, L. & W. Coal Co. 900
  - Tug Tamaqua (supposed), 3 barges, Reading 2,400

Passed, tug Chas. P. Greenough—
- Barge Harvard, N. E. C. & C. Co. 1,603
- Barge Salem and 1 other, N. E. C. & C. Co. 2,100

51,401

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	2	Tugs	12
Barges	7	Barges	27
Schooner	1	Schooners	3
		Bark	1
Total	12	Total	52
Estimated tonnage	13,689	Estimated tonnage	51,401

AUGUST 8.

Passed east:
- Steamship Massachusetts, Eastern S. S. Co. 4,779
- Lighter Cornelia, B. S. & G. Co. 285
- Tug Petrel, 3 barges, Erie 2,700

Passed west:
- Steamship Bunker Hill, Eastern S. S. Co. ... 4,779
- Schooner American Eagle ... 148
- Schooner Telumah ... 230
- Schooner Margaret ... 117

13,038

BOSTON.

Arrived and steamed, steamship Juniata, M. & M. ... 3,465

Arrived:
- Steamship Nantucket, Norfolk ... 2,599
- Steamship J. H. Devereux, Norfolk, Met. Coal Co ... 1,618
- Tug Patience—
  - Barge C. F. Pritchard, Munn ... 900
  - Barge Elk Garden, Munn ... 800
  - Barge Penn, Munn ... 2,000

Steamed:
- Steamship Nacoochee, Savannah, Ocean S. S. Co ... 2,680
- Steamship Persian, Philadelphia, M. & M ... 2,677
- Steamship Middlesex, Norfolk, Coastwise T. Co ... 4,015
- Steamship Harvey H. Brown, Sewalls Point ... 2,673
- Tug M. E. Luckenbach—
  - Barge Carrie Clark, Luckenbach ... 1,298
  - Barge City of Washington, Luckenbach ... 2,410
  - Barge Annie H. Smith, Luckenbach ... 1,487
- Tug Tacony—
  - Barge Devon, Sus. Coal Co ... 724
  - Barge Oxford, Sus. Coal Co ... 836
  - Barge Strafford, Sus. Coal Co ... 678
- Tug Covington—
  - Barge Occidental, Sea. Trans. Co ... 1,532
  - Barge Pottsville, Sea. Trans. Co ... 1,283
- Tug Mercury, towing Uruguayan ship Walden Abbey ...

Highland Light, wind 5 p. m., north, 10 miles; thick and raining; smooth sea; at 3.30 p. m. wind was 60 miles, with rain.

Chatham, 5 p. m., wind NE., fresh; cloudy; thunderstorm:
- Passed eastbound, tug Prudence, barge Reading, Munn ... 1,200

Vineyard Haven, wind SW., fresh; choppy sea; foggy:

Arrived:
- Schooner Jost (Br.) ... 299
- Schooner Myrtle Leaf (Br.) ... 336
- Tug Fred E. Richards—
  - Barge Shickshinny (eastbound), D. L. & W ... 750
  - Barge Cohocton, D. L. & W ... 600
  - Barge R. & R. L. Co. No. 3, R. & R. L. Co ... 600
- Eastbound, tug Georges Creek—
  - Barge No. 5, Con. Coal Co ... 909
  - Barge No. 17, Con. Coal Co ... 935
  - Barge No. 30, Con. Coal Co ... 900

43,669

In canal:		Around cape:	
Steamers	2	Steamers	9
Tug	1	Tugs	8
Barges	3	Barges	18
Lighter	1	Schooners	2
Schooners	3		
Total	10	Total	37
Estimated tonnage	13,038	Estimated tonnage	43,669

AUGUST 9.

Passed west:
- Steamship Massachusetts, Eastern S. S. 4,779
- Lighter Cornelia, B. S. & G. Co. 285
- Schooner Rhoda Holmes 375

Passed east:
- Steamship Bunker Hill, Eastern S. S. 4,779
- Lighter Wm. H. Moody, towing 1 barge 900
- Schooners Mattie Johnson 598
- Schooners Kate L. Pray 59

11,775

BOSTON.

Arrived:
- Steamship Kershaw, Baltimore, M. & M. 2,599
- Steamship Quantico, Philadelphia, M. & M. 2,676
- Tug Germantown—
  - Barge Glendower, Reading 855
  - Barge Moselem, Reading 963
- Tug Boxer—
  - Barge Bethayres, Reading 955
  - Barge Preston, Reading 855
- Tug Conestoga—
  - Barge Manheim, Reading 955
  - Barge Draper, Reading 855
  - Barge Bath, Reading 800
- Schooner Ruth E. Merrill 3,003

Cleared, steamship H. M. Whitney, Eastern 2,706

Steamed:
- Steamship Nantucket, Newport News, M. & M. 2,599
- Steamship Newton, Baltimore, N. E. C. & C. 5,194
- Steamship Juniata, Norfolk, reported yesterday detained in fog, M. & M.
- Steamship Bylayl, Philadelphia .....
- Tug Three Friends—
  - Barge Nanticoke, Doughtery 1,100
  - Barge Harry F. Hooper 726

Anchored, waiting for better weather.

8th, tug Vesta, barge Frank Pendleton, Luckenbach 1,393

Highland Light, wind 5 p. m., NE., 25 miles; thick and raining; smooth sea.

Nobska, 10.50 a. m., wind N., 3 miles; foggy:
- Passed, eastbound, schooner Martha P. Small 2,178
- Passed, eastbound, steamer Geo. Hawley, Va. Trans. Co. 2,549
- Passed, 8th, steamer Matao .....
- Passed, eastbound, tug Valley Forge—
  - Barge Temple, Reading 963
  - Barge Manatawny, Reading 721
- Passed, eastbound, tug Nottingham—
  - Barge L. & W. 3, L. & W. Coal 900
  - Barge L. & W. 6, L. & W. Coal 600
  - Barge L. & W. 7, L. & W. Coal 600

Vineyard Haven, wind NE., fresh; choppy sea; foggy:
- Sailed, schooner L. L. Hamlin (arrived at the Vineyard on the 7th).
- In port 9th, tug (eastbound), Fred E. Richards—
  - Barge Shickshinny, D. L. & W.
  - Barge Cohocton, D. L. & W.
  - Barge R. & R. L. Co., R. & R. L. Co.

Arrived at Vineyard Aug. 8.
- Arrived 9, tug Georges Creek—
  - Barge 5, Con. Coal Co.
  - Barge 17, Con. Coal Co.
  - Barge 20, Con. Coal Co.

Arrived at the Vineyard Aug. 8.

36,745

In canal:		Around cape:	
Steamers	2	Steamers	9
Lighters	2	Tugs	7
Schooners	3	Schooners	2
Barge	1	Barges	15
Total	8	Total	33
Estimated tonnage	11,775	Estimated tonnage	36,745

AUGUST 10.

Passed west:	
Steamer Bunker Hill, Eastern S. S. Co	4,779
Tug Three Friends—	
Barge Nanticoke, Dougherty	1,100
Barge H. F. Hooper	726
Schooner Jos. Young	261
Passed east:	
Steamship Massachusetts, Eastern S. S. Co	4,779
Tug Juno, towing schooner Mystic	259
	11,904

BOSTON.

Arrived:	
Steamship Katahdin, Jacksonville, Clyde Line	2,696
Steamship Malden, Baltimore, N. E. C. & C	5,107
Steamship Geo. Hawley, Sewalls Point, Va. Trans. Co	2,549
Steamship Gloucester, Norfolk, M. & M	2,541
Barge H. A. Allyn	
Steamed:	
Steamship Kershaw, Norfolk, M. & M	2,599
Steamship H. M. Whitney, New York, Eastern S. S	2,706
Steamship Malden, Sewalls Point, N. E. C. & C. Co	5,107
Steamship Quantico, Philadelphia, M. & M	2,676
Tug Germantown—	
Barge Skippack, Reading	739
Barge Buck Ridge, Reading	915
Barge Molino, Reading	954
Highland Light, 5 p. m., wind ESE., 25 miles; thick and raining; rough sea.	
Vineyard Haven, Aug. 10:	
Arrived, eastbound—	
Tug Lehigh—	
Barge 702, L. V. R. R	934
Barge 741, L. V. R. R	700
Barge 765, L. V. R. R	550
Tug Gypsum King, 3 barges, J. B. King	2,100

In canal:		Around cape:	
Steamers	2	Steamers	8
Tugs	2	Tugs	3
Barges	2	Barges	10
Schooners	2		
Total	8	Total	21
Estimated tonnage	11,904	Estimated tonnage	32,873

AUGUST 11.

Passed east, steamer Bunker Hill, Eastern S. S	4,779
Passed west:	
Steamer Massachusetts, Eastern S. S	4,779
Schooner Chas. H. Klinck	522
Schooner Mary Weaver	222
Arrived at Sandwich:	
Tug Penobscot—	
Barge S. T. Co. No. 2, S. T. Co	526
Barge Camden	694
Tug Petrel, Erie R. R	422
	11,950

BOSTON.

Arrived:
- Steamer Ontario, Baltimore, M. & M. 3,099
- Steamer Grecian, Philadelphia, M. & M. 2,827
- Steamer City of Atlanta, Ocean S. S. 5,433
- Steamer Suffolk, Norfolk, Coastwise S. S. 4,718
- Steamer Herman Winter, New York, Eastern S. S. 2,625

Steamed:
- Tug Honeybrook, barge L. & W. 14, L. & W. Coal 900
- Steamer Gloucester, Newport News, M. & M. 2,541
- Steamer Brandon, Baltimore, N. E. C. & C. 2,431
- Steamer Joney (Dan.), Philadelphia. .....
- Steamer J. H. Deveraux, Norfolk, Met. Coal Co. 1,618
- Tug International—
  - Barge Bear Ridge, Reading 910
  - Barge Cleona, Reading 956
  - Barge Yardley, Reading 963
  - Prudence .....

Highland Light, 5 p. m., wind NE., 25 miles; partly cloudy and foggy, rough sea:
- Passed steamer Manxman (Br.) 4,827

Chatham, 5 p. m., wind E., strong, cloudy:
- Passed Steamer North Star, Eastern S. S. 3,159
- Passed tug Patience, barge Harrisburg, Munn 1,300
- Anchored at Handkerchief Light Tug Georges Creek, Con. Coal Co.—
  - Barge 5.
  - Barge 17.
  - Barge 20.
- Arrived at the Vineyard Aug. 8.

Nobska, Aug. 10:
- Anchored off Tug Lenape—
  - Barge Bast (eastbound), Reading 693
  - Barge Pocopson 721
  - Barge Exeter 1,780

Vineyard Haven:
- Arrived (westbound) tug Clincher—
  - Barge Rahn, L. C. & N. Co. 932
  - Barge Summitt Hill, L. C. & N. Co. 600
- Passed schooner Wawenock 325

43,358

In canal:		Around cape:	
Steamers	2	Steamers	12
Schooners	2	Schooner	1
Tugs	2	Tugs	6
Barges	2	Barges	10
Total	8	Total	29
Estimated tonnage	11,950	Estimated tonnage	43,358

AUGUST 13.

Arrived tug Wm. Yerkes, jr., barge Panther Creek, L. C. & N. Co. 600

Passed west:
- Steamer Massachusetts, Eastern S. S. 4,779
- Schooner Chas. L. Jeffrey 348
- Tug Hamilton A. Mathes 48
- Tug Petrel, 3 barges, Erie 2,400

Passed east:
- Steamer Bunker Hill, Eastern S. S. 4,779
- Tug May, 2 barges 1,400
- Tug Mercury, 3 barges, B. T. B. Co. 2,400
- Schooner Gilbert Stancliffe 117
- Steam lighter Cornelia, B. S. & G. Co. 285

Arrived at Sandwich:
- Schooner May E. Olys..... 224
- Schooner Pochasset..... 254
- Schooner G. H. Perry..... 250
- Schooner Sarah Eaton..... 199

18,083

BOSTON.

Arrived:
- City of Augusta, Savannah, Ocean S. S..... 2,869
- Persian, Philadelphia, M. & M..... 2,677
- Juniata, Norfolk, M. & M..... 3,465
- Middlesex, Norfolk, Coastwise S. S..... 4,727
- Bay View, Norfolk, White Oak T. Co..... 1,399
- Coastwise, Norfolk, Coastwise T. Co..... 4,015
- Everett, Norfolk, N. E. C. & C. Co..... 5,107
- Bay State, Newport News, White Oak..... 1,245
- Tug Concord, barge Gibson, Staples..... 839
- Tug Prudence, barge Lynn, Shawmut..... 1,500

Steamed, tug Tamaqua—
- Barge Eagle Hill, Reading..... 911
- Barge Spring, Reading..... 1,780
- Barge 1 other, Reading..... 800

Proceeded, 12th motor ship California (Dan.) for Baltimore.....

Steamed:
- 12th, steamer Gulfaxe (Dan.) for Baltimore.....
- 13th, tug Concord—
  - Barge Braddock, Staples..... 678
  - Barge Tipton, Staples..... 830

Sailed 12th, schooner Geo. M. Warner (Br.).....

Vineyard Haven, Aug. 13, wind NW., fresh breeze, cloudy, choppy sea:
- Arrived—
  - Schooner Geo. H. Ames..... 443
  - Schooner Lydia H. Roper..... 321
  - Schooner John A. Beckerman..... 485
  - Schooner Quickstep..... 282

Steamed eastbound:
- Tug Lehigh—
  - Barge 702, L. V. R. R.....
  - Barge 741.....
  - Barge 765.....

  Arrived at the Vineyard Aug. 10.
- Tug Edgar F. Luckenbach, 1 barge, Luckenbach..... 1,000
- Tug Fred E. Richards—
  - Barge Shickshinny, D. L. & W.....
  - Barge Cohocton, D. L. & W.....
  - Barge R. & R. L. Co. No. 3, R. & R. L. Co.....

  Arrived at the Vineyard Aug. 8.
- Passed (eastbound) 13th—
  - Tug Paoli, 3 barges, Sus. Coal Co..... 2,100
  - Tug Lykens—
    - Barge Lincoln, Reading..... 855
    - Barge Maple Hill, Reading..... 911
    - Barge Tabor, Reading..... 963
- Passed (westbound)—
  - Tug Chas. W. Parker, jr.—
    - Barge Biwabik, N. E. C. & C. Co..... 640
    - Barge Flora..... 865
  - Tug Gwalia—
    - Barge Potomac, Dougherty..... 1,100
    - Barge Cassie, N. E. C. & C. Co..... 1,000
  - Tug Nottingham—
    - Barge 2, L. & W. Coal..... 900
    - Barge 5, L. & W. Coal..... 600
    - Barge 10, L. & W. Coal..... 900

Steamed eastbound—Continued.	
Passed (west bound)—Continued.	
Tug Honeybrook—	
Barge 12, L. & W. Coal	900
Barge 15, L. & W. Coal	953
Barge 14, L. & W. Coal	900
Tug Standard II—	
Barge 67, S. T. Co.	800
Barge 57	800
Barge 123	800
Tug Ontario—	
Barge Liberty, N. Y., O. & W	856
Pilgrim, N. Y., O. & W	1,300
Barge Ellenville, N. Y., O. & W	858
Sailed 13th, schooner Palmetto (Br.)	
	54,374

In canal:		Around cape:	
Steamers	2	Steamers	9
Tugs	5	Tugs	13
Steam lighter	1	Motor ship	1
Barges	9	Barges	30
Schooners	6	Schooners	6
Total	23	Total	59
Estimated tonnage	18,083	Estimated tonnage	54,374

Question No. 10: The effect upon marine insurance, if any, of the operation under Government auspices of the canal, if deepened to 35 feet with a corresponding increase in width with due provision for passing.

Answer: Copies of letters from insurance authorities are attached and marked "Exhibit H."

Note that Johnson & Higgins and the Atlantic Mutual Insurance Co. state that insurance through the canal would be reduced at least 25 per cent. Note the reduction also mentioned by the Providence & Washington Insurance Co. and also John C. Paige & Co.

Note that Mr. Edgar E. Lethbridge, president of the Maritime Exchange, New York, testified at the hearing before the Committee on Commerce, United States Senate, May 28, 1917. (See Exhibit I.)

From the exhibits mentioned above it will be seen that if the canal is deepened to 35 feet and widened another 100 feet, with due provisions for passing, that the marine insurance on vessels using the canal will be substantially reduced.

The following extracts are quoted from a letter dated April 21, from Frank & Du Bois, fire, marine, and railroad insurance, 80 Maiden Lane:

"Under certain conditions there is a distinct reduction in rate for using the canal, as follows:

"If a tug or a barge trades only between New York and Boston and intermediate points and tributary inland waters, they may make the trip through the canal and may be insured at inland rates. If they make the trip round the cape, they would require ocean privilege and would be rated under the ocean tariff of the Atlantic Inland Association, which is consistently higher. The rates vary with different kinds of barges and tugs, and with their ages. Take, for instance, an ordinary barge (not molded) over 10 years old. The rate charged between New York and Boston, using the canal, would be 5½ per cent, and the rate with privilege to go round the cape would be 12 per cent per year. This is the greatest difference. With newer boats and molded barges or steel vessels, the rates would be lower, and therefore the difference in rates would be lower.

'We then called on Mr. Beebe, of the firm of Carpenter & Baker, marine agents in New York for five marine insurance companies. We called on him in particular with reference to the coal-barge trade. His office, we believe, insures more of the coal trade than all others put together. He advised that they would like to have the coal barges use the canal, and repeated what Mr. Burke advised, that the rates would be lower for barges trading between New York and Boston if they used the canal, rather than if they used the outside route. But he pointed out that on coal barges coming up

from points south of New York, which needed the outside ocean privilege anyway, there would be no saving if they did not go round the cape, for they would have to pay for the outside privilege for waters south of New York as much as they would if they went round the cape.

"None of these various underwriters to whom we talked raised any question of the width of the canal, or the currents therein, from a marine insurance standpoint, but Mr. Beebe told us that barge owners had told him that the canal was too narrow for their barges and that was why they were not using it; and that other owners had told him that the charges were prohibitive and that was why they were not using it."

Appendix C, Part 3.

Exhibit H.

COMMENTS OF LARGE COMPANIES DOING MARINE INSURANCE BUSINESS.

Johnson & Higgins (Mr. Wm. V. Brockie).—The usual rates for marine insurance to New England points from New York, Philadelphia, Baltimore, Norfolk, and southern points on coal, stone, ice, lumber, cement, and other commodities are by sailing vessels or barges from about one-half per cent in summer to three-fourths per cent in winter. (From Atlantic ports not south of Norfolk to New England ports east of Cape Cod.) From southern Atlantic and Gulf ports, by sailing vessels and barges the rates would range from about 1 per cent to 1¾ per cent. These rates are available for approved vessels. Undesirable vessels on account of age or lack of repairs would be charged extra rates. Rates by steamers range from one-tenth of 1 per cent to one-fourth of 1 per cent.

In my opinion at least 95 per cent of the merchandise shipped coastwise in the United States is insured.

The underwriters would undoubtedly recognize that vessels using the Cape Cod Ship Canal would be exempt from the many dangers which now attend voyages through Vineyard Haven Sound and around Cape Cod. In my opinion a reduction of 25 per cent of the rates charged would be made to sailing vessels and barges using the proposed route through the Cape Cod Ship Canal. The rates charged on merchandise by steamers is already so low that shippers could scarcely expect to have this reduced; but there is no doubt that if the canal were built and used largely and successfully, a new and lower basis of insurance rates for steamers would be established.

Insurance is placed yearly on hulls of vessels; would say that 90 per cent of them are insured. The annual rate on barges and sailing vessels are from 7 per cent to 8 per cent and on steamers from 4 per cent to 5 per cent. These rates cover ocean voyages and might be shaded if the vessels were warranted confined to inland waters, such as Long Island Sound, Buzzards Bay, and Massachusetts Bay.

Providence-Washington Insurance Co., Providence, R. I., (J. B. Branch, president).—I think at least 80 per cent, probably more, of Atlantic coastwise shipping tonnage is insured. The hulls are almost invariably insured by the year, and rates vary from 6 per cent to 14 per cent, according to each rig and the business in which they are engaged, but this canal would not, presumably, affect yearly hull rates. Taking the current coal rates as a fair illustration, about 20 per cent less is now charged to ports south of Cape Cod than to those north. Fifty per cent of this difference, or an average of 10 per cent would, in my opinion, be a fair average estimate of the saving on insurance premiums through the canal.

John C. Paige & Co., Boston.—We are brokers; underwriters could give better information. To our minds there is no doubt but what the rates for insurance upon vessels or their cargoes coming into the port of Boston from any or all ports south of the cape would be so materially reduced in case of their use of a properly constructed canal toward Cape Cod as to make such a canal of material advantage to ship owners as well as to the owners of all vessels entering the port of Boston from the South. It is, as you no doubt know, common with underwriters to make one rate for either vessels or merchandise for ports south of the cape and another rate upon the same vessels or merchandise coming to ports north of the cape. It would seem to us as though underwriters should be willing to reduce this additional charge for around-the-cape service by one-half in those cases where the canal was used.

Atlantic Mutual Insurance Co., New York (A. A. Raven, president).—All those interested in the commerce of the United States must of necessity favor such a project, and we certainly are disposed to give it all the encouragement we can, and as underwriters deem it would be favorable to navigation and minimize shipwreck between

Long Island Sound and the Eastern States. Underwriting is purely a matter of experience. We think, however, that a reduction of at least 25 per cent would be as near as we can give in the form of an estimate. The difference between the rates of premium by sailing vessels or steamers and ordinary barges is about 20 per cent as between barges and sailing vessels in favor of the latter. I would think at least 75 per cent of the coastwise traffic is insured.

EXHIBIT I.

PURCHASE OF THE CAPE COD CANAL.

[Hearing before the Committee on Commerce, United States Senate, Sixty-fifth Congress, first session, on S. 2277, a bill to enable the Secretary of War and the Secretary of the Navy to enter into negotiations for the purchase of the Cape Cod Canal and for other purposes. May 28, 1917. Printed for the use of the Committee on Commerce.]

(Committee on Commerce: Duncan U. Fletcher, Florida, chairman; George E. Chamberlain, Oregon; Joseph E. Ransdell, Louisiana; Morris Sheppard, Texas; James K. Vardaman, Mississippi; John K. Shields, Tennessee; Thomas S. Martin, Virginia; John H. Bankhead, Alabama; Furnifold McL. Simmons, North Carolina; James A. Reed, Missouri; William F. Kirby, Arkansas; Knute Nelson, Minnesota; William Alden Smith, Michigan; Wesley L. Jones, Washington; Lawrence Y. Sherman, Illinois; Warren G. Harding, Ohio; Bert M. Fernald, Maine; William M. Calder, New York; Hiram W. Johnson, California. William L. Hill, clerk; D. C. Thornton, assistant clerk.)

UNITED STATES SENATE,
COMMITTEE ON COMMERCE,
Washington, D. C., Monday, May 28, 1917.

The committee met pursuant to call at 10.30 o'clock a. m. in the committee room, Capitol, Senator Duncan U. Fletcher presiding.

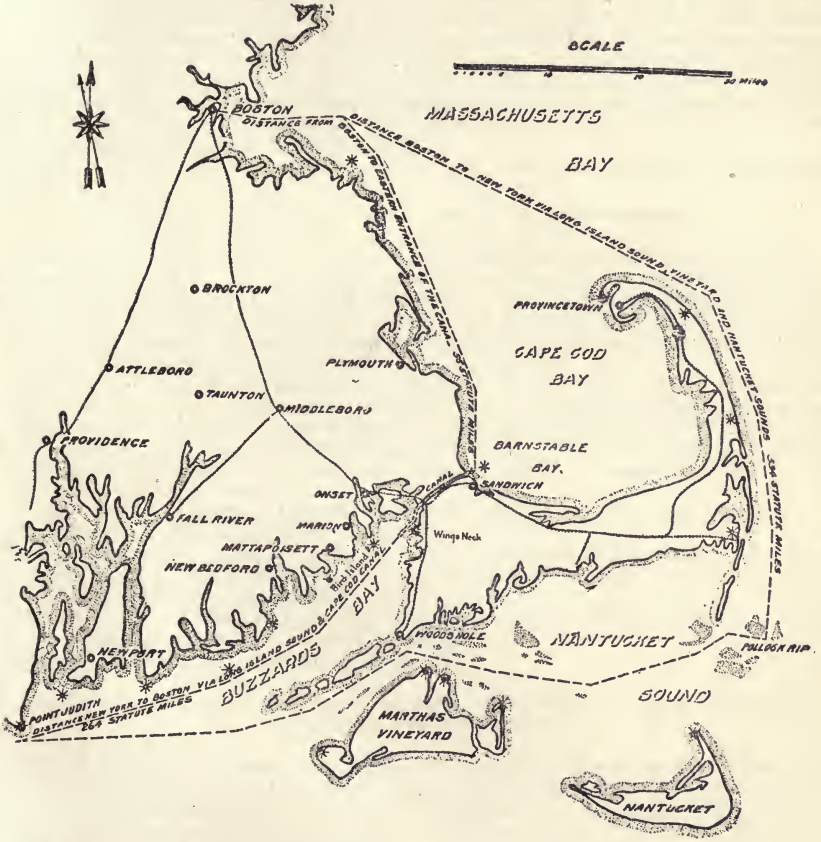
Present: Senators Fletcher (chairman), Ransdell, Vardaman, Shields, Martin, Bankhead, Reed, Kirby, Nelson, and Calder.

Also present: Senator John W. Weeks, of Massachusetts; Senator Henry Cabot Lodge, of Massachusetts; Admiral W. S. Benson, Chief of Office of Naval Operations, General Board, Navy Department; Mr. Calvin Austin, president of the Eastern Steamship Lines; Mr. John N. Cole, chairman of the Commission on Waterways and Public Lands of the State of Massachusetts; Hon. William Cox Redfield, Secretary of Commerce; Mr. Edward E. Blodgett, representing the Boston Chamber of Commerce; Mr. Edgar E. Lethbridge, president of the Maritime Exchange of New York City; Mr. H. H. Raymond, president of the Clyde Steamship Co. and of the Mallory Steamship Co.; Mr. Eben S. S. Keith, a member of the council of the governor of Massachusetts; Mr. H. H. Hageman, representing the marine department of the Philadelphia & Reading Railroad; Mr. L. D. Dow, representing the American Merchant Marine Association and the American Steamship Licensed Officers' Association; Mr. I. S. Buchanan, superintendent of the floating equipment of the Wilkes-Barre Railroad Co.; Mr. Gerry L. Brooks, representing the Chamber of Commerce of Portland, Me.; Mr. John H. Pruett, president of the National Maritime Association of Masters, Mates, and Pilots; Mr. J. C. Reichert, representing the New York Tow Boat Exchange and New York boat owners; Hon. William S. McNary, a member of the Waterways and Land Commission of the State of Massachusetts; Mr. J. W. Miller, late lieutenant commander, United States Navy, formerly president of the Long Island Sound Lines, and others.

The committee proceeded to consider the bill (S. 2277) to enable the Secretary of War and the Secretary of the Navy to enter into negotiations for the purchase of the Cape Cod Canal, and for other purposes, as follows:

"S. 2277. A BILL To enable the Secretary of War and the Secretary of the Navy to enter into negotiations for the purchase of the Cape Cod Canal, and for other purposes.

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That in order to enable the Secretary of War and the Secretary of the Navy to completely report on certain portions of the improvements, as provided in the 'Act making appropriation for the naval service for the fiscal year ending June thirtieth, nineteen hundred and seventeen, and for other purposes,' approved August twenty-ninth, nineteen hundred and sixteen, they are


SCALE
30 MILES
BOSTON
DISTANCE FROM BOSTON TO ENTRANCE OF THE CANAL 56 STATUTE MILES
DISTANCE BOSTON TO NEW YORK VIA LONG ISLAND SOUND, VINEYARD AND NANTUCKET SOUNDS 288 STATUTE MILES
MASSACHUSETTS
BAY
BROCKTON
ATTLEBORO
TAUNTON
MIDDLEBORO
PLYMOUTH
PROVINCETOWN
CAPE COD
BAY
PROVIDENCE
BARNSTABLE
BAY.
SANDWICH
CANAL
ONSET
FALL RIVER
MARION
MATTAPOISETT
Wings Neck
NEW BEDFORD
BUZZARDS
BAY
WOODS HOLE
NANTUCKET
PULPIT RIP
NEW PORT
SOUND
POINT JUDITH
DISTANCE NEW YORK TO BOSTON VIA LONG ISLAND SOUND & CAPE COD CANAL
288 STATUTE MILES
MARTHAS
VINEYARD
NANTUCKET

hereby authorized to enter into negotiations for the purchase of the existing Cape Cod Canal, with the property, franchises, and appurtenances used or acquired for use in connection therewith or appertaining thereto; and they are further authorized, if in their judgment the price for such canal is reasonable and satisfactory, to make contracts for the purchase of the same, at the option of the United States, subject to future ratification and appropriation by the Congress.

"SEC. 2. That in the event of the inability of the Secretary of War and the Secretary of the Navy to make a satisfactory contract for the voluntary purchase of said Cape Cod Canal and its appurtenances, they are hereby authorized and directed, through the Attorney General, to institute and carry to completion proceedings for the condemnation of said canal and its appurtenances, the acceptance of the award in said proceedings to be subject to the future ratification and appropriation by Congress. Such condemnation proceedings shall be instituted and conducted in, and jurisdiction of said proceedings is hereby given to, the District Court of the United States for the District of Massachusetts, substantially as provided in 'An act to authorize condemnation of land for sites for public buildings, and for other purposes,' approved August first, eighteen hundred and eighty-eight; and the sum of $5,000 is hereby appropriated to pay the necessary costs thereof and expenses in connection therewith.

"SEC. 3. That the said Secretaries are further authorized and directed to report their proceedings hereunder to the Congress."

Senator RANDELL (in the chair). Senator Weeks, will you make your statement now?

STATEMENT OF SENATOR JOHN W. WEEKS, OF MASSACHUSETTS.

Senator WEEKS. Mr. Chairman, the bill on which this hearing has been called is Senate 2277, which provides for the possible purchase of the Cape Cod Canal, a map of which is hanging on the wall behind you. I shall want to amend this bill by providing that the Secretary of Commerce be included with the Secretary of War and the Secretary of the Navy in the negotiations which will take place if the committee and Congress take favorable action on the bill.

I am not going to make any statement at this time, because there are a large number of witnesses here, some of whom have important duties and some of whom have come from a distance, and I want to have them given an opportunity to be heard first, Mr. Chairman, and I will ask Admiral Benson, who is the Chief of the Office of Naval Operations of the Navy Department, to take the stand, because, naturally, he is extremely busy at this time.

Senator WEEKS. I ask that this map may be printed as a part of these hearings.

The CHAIRMAN. Very well; that will be done.

Senator RANSDELL. Admiral, will you take a seat opposite the stenographer and proceed? Senator Weeks, will you have the admiral make a statement in his own way, or do you wish to question him?

Senator WEEKS. I wish to have the admiral make a statement in his own way, and the members may want to ask him questions.

Senator RANSDELL. Proceed, Admiral Benson.

STATEMENT OF ADMIRAL WILLIAM S. BENSON, CHIEF OF THE OFFICE OF NAVAL OPERATIONS, NAVY DEPARTMENT.

Admiral BENSON. I assume I am before the committee to express my views as to the importance of the Cape Cod Canal from a naval standpoint. I have given the subject considerable thought, not only the Cape Cod Canal but the entire subject of interior water communication along our eastern coast. The Cape Cod Canal is of special value from a strategic standpoint—a naval standpoint—because it connects two areas of great importance commercially—the New England coast, and particularly the Boston or Massachusetts Bay area, with the Newport, Long Island Sound, and New York area. It will acquire additional importance if the contemplated measures for deepening Hell Gate are carried through; and they must eventually be carried through, whether at this time or some other time, on account of the additional tremendous strategic importance.

(The map referred to is here printed.)

Senator WEEKS. Appropriations have been made for that purpose, Admiral.

Admiral BENSON. I knew a measure was up. I did not know just what its status was at present.

Also, the importance of this canal has been particularly emphasized during the progress of the present war, and particularly along the line of development of the submarine activity. I will say this, that a great many of my brother officers who are recognized authorities on naval strategy do not altogether agree with me in regard

to the great importance of the canal, but I think, in the light of the conditions that exist now; for instance, while we have reason to believe that there is not such great danger from the submarine at present on our coast, it is a thing we have to take measures to guard against and be prepared in case it should come about.

The two areas that I have mentioned, particularly Newport, Long Island Sound, and Massachusetts Bay, are of possibly greater importance than any other part of the United States coast; and facing as we do the great commercial interests of the country and eventually the protection of the eastern coast, the fortifications and others will undoubtedly have to be carried farther to sea. For instance, in course of time all our fortifications will have to be carried out to an extreme limit to seaward, in which case that whole line from New York through Long Island Sound by Point Judith and Buzzards Bay into Massachusetts Bay will be behind the fortifications; and even now it is not at all impracticable to cover the seaward front of that line by nets and other devices for keeping out submarines; and it will connect the New York Navy Yard with the Boston Navy Yard and will enable our vessels to pass from one to the other for repairs or work of any kind that might be necessary.

As is well known, in the present war the battleships of most of the belligerents are being safely guarded in protected waters; and naturally they are not allowed to go outside of these protected waters unless strongly convoyed and well protected; and in case of repair work or work of any kind this work naturally would fall on the one yard that could be easily reached from the rendezvous of the battleship fleet; and, as I said before, having this canal through there would enable the fleet, if assembled in any part of the area, say, from New York to the Cape Cod Canal, to use either the New York yard or the Boston yard and be well protected at all times.

I would like to add, in order that anyone reading my hearing may be impressed with the value in the future of extending this line along the coast, that the same principle would apply there and in a marked degree if we had the same communication between New York Bay and the Delaware River and the Delaware River or Bay and Chesapeake Bay. It applies more particularly from a strictly naval standpoint along those lines, in order to move our large vessels with perfect safety.

Of course, in addition to that, the passage around Nantucket Shoals is not only long but the weather conditions, such as the fogs, currents, and hazy, cloudy weather, where observations are hard to obtain, make it always a more or less risky passage around there; but this applies more particularly to the commercial interests.

Senator KIRBY. About what is the distance saved by going through the canal in place of going around Cape Cod?

Admiral BENSON. Taking it from New York through the Cape Cod Canal or through the Nantucket route there, it is about 70 miles less—that is, where you go through what is marked Vineyard Sound, there is about 70 miles saved by going through the canal now—but that is only available now for vessels of light draft. Battleships can not go through there. Around the other way the difference is about 140 miles.

Senator WEEKS. That is to say, there is 140 miles saved by going through the canal instead of outside?

Admiral BENSON. It is 140 miles farther, going outside. I am looking at it from the naval standpoint; from the standpoint that that whole outer line will undoubtedly eventually be protected by the Coast Artillery and other arrangements.

From a commercial standpoint—and in my study of this problem I have always given that consideration, that where the commercial interests and the naval interests could be both advanced, it was well to keep them both in contact at all times—the importance from a commercial standpoint is so apparent that I do not think it needs any discussion at all, particularly when you remember that one of the great questions that is before us now is one of getting sufficient coal from the southern coal fields to New England. That is a problem that we constantly have under consideration, with our preparation, etc., from the naval standpoint.

Senator KIRBY. Would that be improved any by reason of the Government owning the canal, so far as as commerce is concerned, over the condition as it exists with private ownership of the canal?

Admiral BENSON. The question of ownership I have not taken into consideration at all. I have nothing to say in regard to that, except that I will say that the attitude of the Navy Department in respect to the Government taking it over and completing it and making it a battleship canal has been this, that the great demand is being made——

Senator KIRBY. If you will just excuse me a minute——

Admiral BENSON. Yes.

Senator KIRBY. I do not know whether this canal at present is of sufficient capacity to carry any sort of tonnage, or what kind of tonnage, or how much it will have to be improved to carry battleships.

Admiral BENSON. I do not think it would make any material difference as to that point of it.

Senator KIRBY. What I was trying to get at was, will the Government have to make a canal there that is sufficient for its purposes during the war to carry battleships and serve its purposes, and is it sufficient now to carry commerce?

Admiral BENSON. It is not sufficient now to carry battleships, and it is sufficient to carry merchant ships drawing only about 22 feet of water. The largest ship that we have ever sent through there was the *Salem*, which went through recently without any difficulty. She is a vessel of about 3,500 tons, one of our long scout cruisers.

Senator WEEKS. How much water does she draw?

Admiral BENSON. I think she was drawing then about 18 or 19 feet. I understand you can carry 22 feet through there safely.

(Senator Fletcher here assumed the chair.)

Senator RANSDELL. From the commercial point of view, I take it that the dangers to ships outside are very much greater than if they took this passage through the canal?

Admiral BENSON. Very much greater.

Senator WEEKS. In addition to saving the distance, they escape the dangers of the passage outside, which to commerce are very great?

Admiral BENSON. There is scarcely a point on our coast where it requires more careful navigation and where conditions are more unfavorable than around Nantucket Shoals. The currents are bad, and as I say, frequently the weather is such that you can not get clear observations, and you have to go by the soundings, of course, and it is considered a very difficult and more or less dangerous navigation.

Senator RANSDELL. I can understand very clearly the benefit to commerce of the use of this canal, but I am not quite clear as to where the Navy is going to come in there. You say it is too shallow now for the use of the big vessels. Will you not make that clear to me?

Admiral BENSON. Well, as I say, it would shorten the route, but the big vessels could not use it now.

Senator RANSDELL. They could not use it now?

Admiral BENSON. No.

Senator RANSDELL. But you have a great many vessels that could use it?

Admiral BENSON. Yes; our destroyers and submarines, and most of our gunboats and small cruisers could use it. Everything up to 20 feet draft, I should say, could go through there without difficulty. I think 22 feet is about what they can depend on, going through there, at this time.

Senator RANSDELL. If the Government should purchase this canal, would you contemplate its very considerable enlargement?

Admiral BENSON. I should think it would be almost necessary to do that.

Senator RANSDELL. So as to make it available for big boats of commerce and of the Navy?

Admiral BENSON. And for naval vessels. I should strongly advise, if the Government bought it, that it be made suitable not only for taking any of our ships through there, but that it be put in such condition that it would be of easy use for any commercial interests whatever.

Senator RANSDELL. If that were done, would it lessen the coast defenses—the line of coast defenses—materially, or would you still have to have the coast defenses?

Admiral BENSON. No; I think in order to get the full value out of it we should have the coast defense to protect that line.

Senator RANSDELL. Even out beyond?

Admiral BENSON. Yes; for instance Block Island, Montauk Point, and Gay Head—those points ought to all be and undoubtedly will in course of time be utilized for our outer line of defense.

The CHAIRMAN. I would like to inquire as to what the size of the canal is.

Admiral BENSON. As I say, the depth is about 22 feet. The exact dimensions of it I really do not know.

Senator WEEKS. There is some variation in the depth. It is from 21 to 25 feet, I think.

The CHAIRMAN. And what is the width of it?

Admiral BENSON. One hundred feet, I believe, sir.

Senator WEEKS. A German submarine appeared off this section of the country last year and sunk several ships. Will you point out the location where those ships were sunk, and how that might have been avoided if this canal had been available for them in passing along the coast?

Admiral BENSON. Most of them were sunk off Nantucket Lightship, just off the southern region there, the point of Nantucket Shoals [indicating on chart]. I think all of them were within a very few miles of the lightship.

Senator LODGE. Yes; they were.

Admiral BENSON. Of course, if they had gone through the canal, while the submarine might have attacked them any place from Point Judith on, there [indicating on map], I think the the fact that it was close inshore might have deterred them. Of course, it made it a much easier proposition for them, being so far from any fortifications or patrol.

The CHAIRMAN. Is there a sufficient depth of water in Buzzards Bay?

Admiral BENSON. There is until just before you reach the entrance to the canal. There would have to be considerable dredging there, and in order to make that canal perfectly satisfactory there should be harbors at either end of it where vessels could either anchor or tie up, awaiting an opportunity to get through the canal.

The CHAIRMAN. How about Cape Cod Bay; how about the water there?

Admiral BENSON. There is plenty of water there. After you get clear of the canal there is deep water right up to Boston.

The CHAIRMAN. Do you know how the water is, whether it is rough or calm, in those bays?

Admiral BENSON. With the wind from certain directions it is fairly rough; but, as a rule, it is not so bad, because, you see, it is well protected there by the coast of Massachusetts. Of course, in a northeaster, it blows in there pretty strong, but I do not think that is a question that would make any trouble. Of course, it would be very much better for smaller craft; and as I said, under any conditions, there should be a harbor at each end, or facilities for vessels to tie up or anchor and be protected while awaiting passage through the canal.

Senator VARDAMAN. Has there ever been an estimate made of the probable amount of work, or excavation that would have to be made, to perfect that canal?

Admiral BENSON. I think all those data are on record.

Senator BANKHEAD. What is the length of the Cape Cod Canal?

Admiral BENSON. It is 7 or 8 miles. I have forgotten its exact length. It is very nearly 8 miles.

Senator WEEKS. Admiral, if you could connect the New York, Newport, and Boston Yards by a canal of that sort, how much would it increase the efficiency of a fleet operating on that coast.

Admiral BENSON. It is rather difficult to express that definitely. You might say it would not double the efficiency of the fleet; but, for instance, suppose that we had a big dry dock at both places, New York and Boston, and we had an engagement off Block Island there, for instance, and there were enough injuries to vessels to require the docking facilities at both places, and the repair facilities; if we could take them up through the canal to Boston and to New York we could utilize the full capacity of both yards instead of only one. I think that is about as near a definite expression of the conditions as I could put it.

Senator WEEKS. It would increase the capacity of the naval forces to protect both New York and Boston, to have a direct connection, would it not?

Admiral BENSON. Yes, undoubtedly; and you can readily understand that a force, to interfere with the passage of a fleet through there, would have to be sufficiently large to be, practically—they would not know which way they were going, and they would have to be—scattered all along the coast in order to get track of it.

Senator WEEKS. You spoke of a harbor at either end of the canal. You recall that there is a harbor of refuge at Point Judith, and that substantially Newport Harbor is a harbor of refuge?

Admiral BENSON. Yes; and Buzzards Bay is, of course, in a way, comparatively safe. There is nothing so very bad in Buzzards Bay, because it is an inclosed water, and for smaller craft it would be very desirable to have something of that sort, particularly in the northeast, on the other end. There should be something there to protect them.

Senator WEEKS. The Navy is now sending destroyers and other vessels of that class through the canal?

Admiral BENSON. Yes; we have sent a good many.

Senator WEEKS. And the largest ship you have sent through is the *Salem*, that you have described?

Admiral BENSON: Yes.

Senator WEEKS. It is the largest ship of the Navy that you could send through, of that class?

Admiral BENSON. Yes; I think it is.

The CHAIRMAN. How much water does she draw?

Admiral BENSON. I think she was drawing about 18 feet when she went through there. That is my impression. I do not remember exactly. now.

The CHAIRMAN. If there are no other questions to be asked of the Admiral now, Senator Lodge is engaged with the Finance Committee, and it would accommodate him if we would hear him now.

Admiral BENSON. Could I make one more statement, as to why this has not been urged?

The CHAIRMAN. Yes.

Admiral BENSON. I started to say a while ago that the demand for appropriations has been so great that the Navy Department did not feel that it was at this time a military necessity. I would like to make that point clear, that that is the attitude of the department in regard to it; that it would take so long that we would not be able to use it with large vessels during the present war, in all probability.

Senator WEEKS. That has nothing to do with the opinion of the department that it would be of value to the Navy?

Admiral BENSON. Not at all; and it was simply the desire up to this time to expend for other purposes all the appropriations Congress sees fit to make for the Navy. In my opinion there is no question whatever about its value to the Navy. None at all, sir.

The CHAIRMAN. Are there any other questions that any member of the committee desires to ask Admiral Benson? If there is not anything further, we will hear Senator Lodge now.

STATEMENT OF SENATOR HENRY CABOT LODGE, OF MASSACHUSETTS.

Senator LODGE. I am much obliged to the committee for allowing me to say a word now to you. The Finance Committee is in session and is at work on the tax bill, and I ought to return there as soon as possible.

I shall not attempt to say anything about the military and naval value of the canal, because Admiral Benson has already spoken on that point, and others are better judges of its importance than I am. Of its ultimate, its real, importance to the Navy, I do not think there can be any doubt.

I wish to say a word in regard to the importance of this canal commercially as well as in time of war. The great bulk of the commerce now goes through the Vineyard Sound south of the capes, and then outside of Cape Cod. This route, which is marked there on the map on the wall, along Vineyard Sound, passes through a network of shoals. It is extremely dangerous navigation all about there. I believe 20,000,000 tons of coastwise shipping went around Cape Cod in 1912. So I have been told.

Senator WEEKS. Yes; that is right.

Senator LODGE. Of the annual average of 20,000,000 tons only about 4,000,000 tons has gone through the canal since its opening. Of course, a very large portion of this trade goes to Boston, naturally, and some even farther north—the trade to the Provinces and to Maine. Between 70,000 and 100,000 vessels pass Cape Ann north of Boston every year, going and coming. There is an immense coastwise trade around that cape, which shows the volume of tonnage passing Cape Cod, of which that going beyond Cape Ann is only a part.

In time of war passing outside of Cape Cod all that important coastwise tonnage would be exposed to submarines when it gets past the Pollock Rip, and it would be a great protection to it to be enabled to go through the canal.

A large proportion of that tonnage does not feel able to pay the canal tolls. It would therefore be an important protection, if the Government took the canal, to the coastwise traffic. Commercially, I do not think its value can be questioned.

To carry the great battleships through the canal, it must be deepened and widened, but there is a large number of naval vessels which can be taken through it now, and most of this coastwise traffic—the great bulk of the coastwise traffic—is in vessels which can very well pass.

Senator VARDAMAN. Senator Lodge, I suppose this was brought out in the original examination of Admiral Benson, but I was not present. Will you state for my information the depth and width of this canal?

Senator LODGE. The canal is about 25 feet deep at low water, and to carry the great battleships it ought to have 35 feet at low water. I do not remember its exact width.

Senator WEEKS. It is about 100 feet at the bottom.

Senator VARDAMAN. What is the length of it?

Senator LODGE. It is 8 miles between the shores—that is, between the Cape Cod Bay end and the other—and it is 4 miles down the bay at the western end, where there will have to be some dredging done for larger vessels.

Senator KIRBY. Who owns this canal now?

Senator LODGE. It belongs to a company chartered by the State of Massachusetts.

Senator KIRBY. Will it be materially improved for commercial purposes by the Government owning it, and why?

Senator LODGE. If the Government owned it, of course the vessels would go through free, and the result would be that practically the whole coastwise trade would go

through there; but the company, of course, built it as an investment, and they charge tolls.

Senator REED. Do you know whether it is profitable?

Senator LODGE. I do not know whether they have made a profit on it. I know that it has earned money.

Senator REED. You do not know the amount of the capital of the company?

Senator WEEKS. It is about $6,000,000 of stock and $6,000,000 of bonds.

Senator LODGE. Yes.

Senator REED. Do you know whether it has paid dividends?

Senator LODGE. No; I do not.

Senator RANSDELL. There will be a witness before the committee who can give all those details.

Senator LODGE. Yes; there will be others who can give those details. I only wanted to call the attention of the committee to the enormous value of that canal to the coastwise trade. It is enormous when you think of 20,000,000 tons going around that cape.

The CHAIRMAN. Do you know what kind of material would be encountered in excavating and enlarging it?

Senator LODGE. I think it is usually sand and gravel there, from what I have known of that region.

Commodore MILLER. There are some bowlders, and there is some clay.

Senator REED. If I do not intrench on the rule, I would like to ask what you said the depth was. I did not catch that.

Senator LODGE. Twenty-five feet. It was built, of course, for commercial traffic entirely. I feel very strongly that the fact of the war makes the preservation of the world's tonnage of the utmost importance and renders it very desirable that we should take every precaution to protect our tonnage, because our coastwise tonnage must be one of the sources to which we shall look and to which we are looking now for aid in carrying necessary supplies to Europe.

Senator REED. How long will it take to complete the necessary work?

Senator LODGE. It can be used for the smaller vessels of war at once. It is open and running and earning money. The necessity of deepening it comes from what Admiral Benson mentioned. You must make the depth 35 feet in order to get the great battleships through; but for ordinary commercial tonnage you can take it as it is to-day.

Senator REED. What would be the saving of distance by that canal?

Senator LODGE. I can not give you the exact figures.

Senator WEEKS. It will be 70 miles if the inside route is used and 140 miles if the outside route is used.

Senator REED. Is it in condition now so that vessels can use it?

Senator LODGE. Yes.

Senator REED. The only trouble is that they must pay tolls?

Senator LODGE. Yes.

Senator REED. If the submarine menace becomes so great that the Government can afford to take over the canal at this time, why is it that the owners of the ships can not afford to pay tolls and so escape the present impending danger?

Senator LODGE. That would be simply to put a great burden on the shipping, and men who run ships are very apt to take risks. As a matter of fact the canal got only 4,000,000 tons in round numbers out of 20,000,000 tons of the traffic up there at the cape.

Senator BANKHEAD. As I understand, that is the route taken by the great coal trade [indicating on map]?

Senator LODGE. Yes; the great coal traffic goes through there.

Senator BANKHEAD. I understood you further to say that that is a very dangerous navigation.

Senator LODGE. Nantucket and Vineyard Sounds and all that region are a network of shoals. Those blue spots on the map show the principal shoals, but if you will look at the bottom of that map you will see Pollock Rip, and that is one of the most dangerous places—I do not believe there is any more dangerous navigation anywhere than there is at that spot.

Senator BANKHEAD. The expectation is this: That if the Government owns the canal and improves it, and gets rid of the tolls, practically all of that shipping will go through the canal?

Senator LODGE. Yes; and from the canal north it is perfectly clear.

Senator BANKHEAD. And the distance will be cut in two?

Senator LODGE. Yes. You will notice, if you will take the line up to Boston Harbor, the navigation is perfectly clear, with no dangers, there.

Senator BANKHEAD. It is clear from there on [indicating on map]?

Senator LODGE. It is perfectly clear.

Senator RANSDELL. Is it not true that there have been many wrecks through the Vineyard and Nantucket Shoals?

Senator LODGE. That region has been a perfect graveyard of ships. There are wrecks all around there. We have Coast Guard stations all along that coast. The ships go on the shoals and they go driving down between the islands, and in the winter there is a regular toll taken of the vessels. It is of the very greatest importance commercially to the coastwise trade. Admiral Benson made the point as to spending money now, when we have so many other calls; but the committee heard him say that the naval value of that canal is very great.

Senator VARDAMAN. What would be the probable cost of it to the Government?

Senator LODGE. That is a matter which I suppose could be arranged with the company.

Senator REED. I do not understand how this can be of any greater naval value to us during the present war——

Senator LODGE. Except for the smaller ships of the Navy.

Senator Reed (continuing). Than it is now.

Senator LODGE. No. They now pay the tolls.

Senator REED. We can take the canal over and proceed to deepen it. How long would it take to deepen it?

Senator LODGE. Oh, that would take some time.

Senator REED. So that for all practical purposes, when we talk about it being of any practical value to us so far as value for this war is concerned——

Senator LODGE. It is of value now to the smaller vessels of the Navy, and the United States has to pay tolls. They sent a ship through there—the Salem—some time since.

Senator REED. The whole question, then, is whether the United States, in the interests of the coastwise trade, ought to buy this canal and make it free.

Senator WEEKS. That is not the whole question.

Senator LODGE. That is not the whole, but that is an important point.

Senator WEEKS. The Senator is raising the question of immediate importance?

Senator REED. Yes.

Senator WEEKS. But for future importance, it is not the whole question.

Senator REED. Oh, no; I grant that.

Senator LODGE. Admiral Benson said it is entirely agreed upon that it is of naval importance for it connects all those naval stations—Boston, Newport, and New York—and it would be of very great value in the future.

(Senator Lodge here left the committee room.)

Senator WEEKS. Mr. Chairman, I would like to call the attention of the members of the committee to the fact that this bill is a preparatory bill. It authorizes the departments to negotiate with the owners of the canal, but they must come back to Congress before any expenditure can be made and for the approval of any negotiations which they agree to.

Mr. Chairman, the Secretary of Commerce is here and he is a very busy man these days, and I would like to have him make a statement now.

The CHAIRMAN. We would be very glad to hear from you now, Mr. Secretary.

STATEMENT OF HON. WILLIAM COX REDFIELD, SECRETARY OF COMMERCE.

Secretary REDFIELD. Mr. Chairman and gentlemen, we have in the Department of Commerce a twofold interest in this canal; first, because we use it constantly ourselves, and, second, because we are at present safeguarding it in a very careful way because of its very great importance to our coastwise commerce. I think the present procedure in safeguarding it may emphasize to the committee the importance that we place upon it as a commercial waterway. We have placed a special force of armed steamboat inspectors at each end of the canal, comprising a force of both engineer and navigating officers. One of those officers proceeds on every vessel to the navigating bridge or place. The other proceeds to the engine room and assumes watch at the engineer's post. The object of that is to prevent the blocking of the canal suddenly by anybody who might be maliciously minded.

In addition to that we have furnished a special armed motor vessel of our navigation service, which is continually patrolling the canal. That is in addition to whatever is done upon the shore of the canal by troops.

I need hardly say that we regard, therefore, this canal as a vital waterway of the largest importance to our coastwise commerce and to our Government vessels. Our lighthouse vessels and the vessels of our navigation service use it more or less frequently, paying the regular tolls which are charged. Perhaps the reason for our unusual watchfulness may be found in the fact that only a short time ago a merchant vessel was stranded in this canal and sunk crosswise of it and shut it up, if I remember correctly, for several weeks, was it?

Mr. WILSON. For several months.

Secretary REDFIELD. For several months. The canal is now considered by us, under an opinion rendered by the Attorney General, which I have here, as a part of the navigable waters of the United States, and we operate upon it under that viewpoint. I have here a copy of the extracts from the opinion of the Attorney General, which may be of some interest.

(The extract referred to by Secretary Redfield is as follows:)

"Syllabus of opinion of the Attorney General, dated May 11, 1891, which has been accepted by the Supreme Court of the United States and many other Federal courts as the settled law of the land:

"All waters are navigable waters of the United States within the meaning of the acts of Congress in contradistinction from the navigable waters of the States where they form in their ordinary condition by themselves, or by uniting with other waters, a continuous highway over which commerce is or may be carried on with other States or foreign countries in the customary modes in which such commerce is conducted by water. The Chicago River and its branches must therefore, be deemed navigable waters of the United States, over which the commercial power of Congress may be exercised to the extent necessary to protect their free navigation, and it is immaterial that the stream was originally nonnavigable or artificially constructed, or wholly within one State or practically controlled by one State or city.

"The power of the State to legislate in regard to navigable waters is subject to the paramount power in Congress to regulate commerce among the several States. Until Congress acts directly in the matter the power of the State is plenary, but when Congress has acted with reference to bridges in the State its will must control, so far as may be necessary to secure free navigation. In section 4 of the river and harbor act, September 19, 1890, chapter 907, Congress has acted and under that act it is the duty of the Secretary of War to ascertain whether the canal street bridge across the South Branch of the Chicago River is an unreasonable obstruction to the free navigation of said river; and if he comes to the conclusion that it is such an obstruction, it is his duty to proceed as required by that statute."

We are now lighting, at Government expense, the entrances to the canal under an appropriation made by Congress for that purpose and are contemplating further public improvements which are detailed in a memorandum which I will hand to the stenographer, if I have your permission to do so.

The CHAIRMAN. Very well.

(The memorandum referred to is here printed in full, as follows:)

"AIDS TO NAVIGATION, CAPE COD CANAL.

"The immediate approaches to the Cape Cod Canal have been marked with aids to navigation under an appropriation made by the act of August 1, 1914. The department first took the ground that unless there was specific provision by Congress these marks should be maintained by the company, being needed for the use of a canal owned by a private company charging tolls, and the approach channel in Buzzards Bay having been dredged by the company at its own expense. Congress, however, by the act of August 1, 1914, made an appropriation of $50,000 for changing existing lights and providing additional lights for the aid of navigation at eastern and western entrances to the Cape Cod Canal.

"At the eastern entrance, Cape Cod Bay, 2 lighted buoys with bells, 1 unlighted buoy, and an electric lens-lantern light were established; at the western or Buzzards Bay entrance 5 lighted buoys (2 with bells), 14 lighted beacons, and 8 unlighted buoys were placed. The heavy ice of the last winter destroyed a number of the beacons, and plans are now being made to replace these by othe raids to navigation. Upon completion by the canal company of the breakwater at the eastern entrance the light will be moved to the outer end and an electric fog bell installed. The light at Wings Neck Light Station, near the western entrance, has been improved by the installation of oil-vapor apparatus, and steps are now being taken to improve the fog signal by substituting a reed horn for the present bell. The appropriation has practically all been expended or obligated.

"The length of the canal proper is marked and lighted by the company.

"The vessels of the Lighthouse Service pay the regular toll in passing through the canal, with the exception of the tender engaged in caring for the aids at the approaches to the canal."

Secretary REDFIELD. We are very painfully familiar, Mr. Chairman—I am familiar from personal experience and the department is familiar—with the peculiar dangers of Vineyard Sound and Nantucket Sound as a part of our outside traffic route. The whole coal traffic from Norfolk and the south and the passenger vessels from the west and the south pass through this narrow and very dangerous outside passage north of

Nantucket Island and southeast of Cape Cod. It is, I was going to say, the most dangerous portion of our Atlantic coast. I think perhaps I may make an exception in favor of Cape Hatteras as being more dangerous; and yet I doubt it, for at this point we have a congestion which is unique. The traffic through those sounds, in which one has to twist and turn even more than that map shows [indicating], is under the very worst conditions on our coast; the channel is in a shifting condition, not a permanent one, and is very much crowded. We have had conference after conference with the towboat people about the length of hawsers that they must carry through that place. It is so bad that it has been made the subject of special regulations as regards long coal tows that go through there. New England's great industries are very largely supplied with coal which now passes through that pasasge, and there is constant difficulty and friction between the passenger steamers coming from Charleston and Savannah and other southern points to Boston and above about these tows. The tows are sometimes a half mile long, and what is satisfactory to the tow man is adverse to the steamship man. There is constant friction and difficulty, and it would be a godsend if we could get the passenger liners wholly away from that very dangerous place. The danger of it is perhaps illustrated by the chart, which shows the constant series of lights all the way through, starting at Gay Head and running through to the northward portion, shown upon the map at the Pollock Rip. The condition is so changeable that we have to alter from time to time the position of our lightships there. They have been constantly run into by the commercial vessel and by the tows.

Senator VARDAMAN. May I ask in that connection, of you or anybody who knows, whether or not Congress has made any appropriation for clearing that channel around?

Senator RANSDELL. Through Vineyard Sound and Nantucket Sound, you mean?

Senator VARDAMAN. No. What is that right there [indicating on map]?

Secretary REDFIELD. That is Pollock Rip.

Senator VARDAMAN. Has any appropriation been made for that?

Senator RANSDELL. Yes.

Secretary REDFIELD. I should say an appropriation had been made to do a certain amount of dredging in that channel, but if we were asked about making provision for a permanent channel we would say you are fighting against the Lord God Almighty, because the whole ocean is there, doing work which it would be almost impossible to prevent.

Senator VARDAMAN. If this canal were to be bought by the Government and deepened, then that would be altogether unnecessary, would it not?

Secretary REDFIELD. Quite so.

Senator VARDAMAN. And you could abandon that route?

Secretary REDFIELD. You can use it for the coal tows; but even if the canal should be made available for the coal tows it would be very much improved by the absence of the regular mercantile ships that would go through the canal.

Senator WEEKS. Speaking of Pollock Rip, you will recall, Mr. Secretary, that it is shifting sand and there is nothing to hold the sand there, and any improvement made would be quite likely to be overcome by the next storm.

Senator VARDAMAN. The information I wanted is, if this route should be adopted and the Government should take over the canal and deepen and widen it as may be necessary and improve the harbors, then there will be no necessity for Government appropriations for the improvement of that channel around Pollock Rip?

Senator WEEKS. That is quite true.

Secretary REDFIELD. I think that is correct.

The CHAIRMAN. Would there be any saving in insurance?

Secretary REDFIELD. Unquestionably.

The CHAIRMAN. By the adoption of the canal route?

Secretary REDFIELD. Yes.

The CHAIRMAN. It looks like the saving on insurance and distance, and all that, would prompt the shipping to go through the canal now.

Secretary REDFIELD. From every point of view, Senator, there is no argument against it except whether we have the money to do it.

The CHAIRMAN. You do not know about charges through the canal?

Secretary REDFIELD. I do not know, but that can be readily found. For instance, that is all in one lighthouse district, and by reason of the present tolls we have to maintain ships at both ends of the line. If that were made a Government canal, the passage through it would be doubled and trebled.

Senator VARDAMAN. What would be the probable cost of making this a Government canal, and its improvement?

Secretary REDFIELD. That is a question I can not answer.

Senator VARDAMAN. Has not an estimate been made upon it?

Secretary REDFIELD. I do not know. I understand this bill provides for that.

Senator VARDAMAN. I do not want to know accurately, but I suppose there have been some general estimates as to the probable cost, have there not?

Senator WEEKS. This bill is to determine the cost of the canal and what it would cost to improve it.

Senator VARDAMAN. What is it worth to the people who own it now? What have they expended on it? What is the capital stock?

Senator WEEKS. We will submit testimony as to the amount of money expended by the next witness; but there are about $6,000,000 worth of bonds issued and $6,000,000 worth of capital stock, under the laws of Massachusetts.

Senator VARDAMAN. It makes an investment of something like $10,000,000 by the Government?

Secretary REDFIELD. From our point of view, Mr. Chairman, the canal is but one of a series of great waterways that should be made, in our judgment, to make our coastwise commerce possible and safe regardless of what an enemy might do. He would be a bold enemy indeed who would venture a public vessel of war in behind those shoals. He could not get around them except by going 40 miles around behind Nantucket, around the lightship, which is nearly 40 miles off the main shore, shown at the right-hand end of that map. This canal is one element of a general coast waterway which would make commerce safe beyond all peradventure of attack by an enemy that even for the time being might hold the sea. Its public value is of the very largest importance, and I feel that these gentlemen who have done it at their own cost have done a great public service by going as far as they have. As I recall it, there is not only something like 22 feet of water in the shallowest place; am I right about that?

Mr. WILSON. Yes; 22 feet in the shallowest place.

Secretary REDFIELD (continuing). But it would be easy to enlarge the canal—easy as an engineering matter to enlarge the canal—as desired. It would be very difficult for a private concern to do it, because the swift current that runs through the canal makes it one of very large difficulty, but it is of such general importance that the Government could well afford to do that thing, and to make that permanent improvement.

Senator VARDAMAN. Well, Mr. Secretary, after you get through considering the war feature, would it be a very great advantage to the commerce of the country?

Secretary REDFIELD. Very great. I doubt if there is any man so foolhardy as to send the vessel around outside if he could get it through the canal. That is a graveyard of ships. From the Nantucket Lightship away down to the Sound, and all the way up there to Provincetown, it is a ship graveyard.

Senator CALDER. You referred to the conditions with regard to the current and the tidal conditions in the canal. Does not that cause some trouble in using the canal at the present time?

Secretary REDFIELD. No; not seriously. It has to be allowed for and it has to be cared for. Any current of 4 or 5 knots, or less, has to be looked out for, but it is not a difficulty which is not readily overcome by ordinary devices.

Senator CALDER. Can ships go both ways on certain tides?

Secretary REDFIELD. Yes. They may have to be towed, if they have not sufficient power of their own; but any vessel with power can go.

Senator CALDER. My information is that at certain tides vessels can go only one way.

Secretary REDFIELD. At certain tides it is easier for vessels to go one way.

Senator CALDER. I mean that they can not go one way at all.

Secretary REDFIELD. We are using the canal with our own boats, but I never heard of that. It is not as easy to go against a four-knot tide as to go with it, but a vessel with ordinary power ought to go through there. A very large vessel, with the limited depth and limited width, might find difficulty. That is one of the reasons I think the Government should take it over. A very large ship would have difficulty.

Senator CALDER. It appeals to me very strongly, but I would like to have information on that point.

Secretary REDFIELD. I think you can get that from Mr. Wilson in detail. We would not want to send a very large ship through there with the present width and depth. She would wallow back and forth against the banks.

Senator RANSDELL. A percentage of the commerce goes through there now?

Secretary REDFIELD. Oh, yes.

Senator CALDER. Without delay by the tide?

Secretary REDFIELD. Yes.

Senator CALDER. Is that right?

Senator WEEKS. I think so.

Senator CALDER. Is there a tide there?

Senator WEEKS. Yes.

Secretary REDFIELD. Do you know, Dr. Jones, what the tide is there, exactly?

Dr. JONES. Yes; it is five knots at the maximum. There is no difficulty at any time in going either way. When they are going with the tide they have to look out for the bridges, which is simply a precautionary matter and very readily overcome. Going against the tide is very much easier, because there is less difficulty about stopping if the bridges are not readily opened.

The CHAIRMAN. I wanted to get at the amount of the tide.

Dr. JONES. Five feet.

The CHAIRMAN. No; how much in amount?

Dr. JONES. The tides vary in accordance with the storms on either end. The minimum depth is 21½ feet at the present day. That is the depth of the water.

The CHAIRMAN. I am speaking about the rise and fall; the difference between low and high tide.

Dr. JONES. It is four or five feet.

Senator VARDAMAN. Another question I want to ask is, What effect has that swift flow through the canal upon its bottom? Does it dredge it out or fill it up?

Dr. JONES. There is variation at places and at times, but nothing serious.

Senator CALDER. Do ships pass to and fro, passing each other on the canal, or is it a fact that ships can go only one way at a time, and then upon signal there is a change, and ships going the other way go through?

Secretary REDFIELD. I think there are passing points. I am not familiar with the navigation rules, but that is my recollection.

Mr. MILLER. Not in the 8 miles.

Senator CALDER. If that is true, it has got to be widened, and that is extremely important.

Secretary REDFIELD. Of course, the Government would not take it over without widening and deepening it, and it is a great question in my mind whether that ought to be done during the war; but as it stands, it is available for vessels, except those of large size.

Senator RANSDELL. Will you elaborate a little about other points where we should improve our waterways along the coast, and state whether or not you agree with the statement of Admiral Benson that there should be water connections between New York Bay and the Delaware River, and between the Delaware River and Chesapeake Bay?

Secretary REDFIELD. We have got to go back in our history only to the year 1815 to find every American port blocked. When the War of 1812 closed the English had every seaport we had tied up. Our vessels of war lay in New London Harbor and could not get out. It is perfectly possible for us, by a relatively small expenditure, to avoid that at any future time by the construction of the Raritan Canal and the canal from Chesapeake Bay to Delaware Bay. In my sober judgment, we can not do that fast enough. That would entirely avoid any such difficulty and free us entirely from the danger of what we suffered in 1815. Our movement coastwise to all ports in war time could not then be stopped by any foreign foe. That could be accomplished at a very small expense. It would not begin to be as much as the Panama Canal cost, and probably not half that much, and for our national life it would be far more important. I think that if we looked at it as a purely sober matter of business, we would not hesitate an hour about taking over the Chesapeake & Delaware Canal and making the connection from the Raritan Bay to the Delaware River.

Senator RANSDELL. And making them large enough to carry the battleships?

Secretary REDFIELD. To carry the largest battleships.

Senator WEEKS. There are three essential steps in that?

Secretary REDFIELD. Three steps.

Senator WEEKS. The Chesapeake & Delaware Canal and the Raritan Canal may be taken over and deepened sufficiently for all purposes for probably not over $30,000,000 or $35,000,000?

Secretary REDFIELD. I should think so, or for less.

Senator WEEKS. It is simply the cost of the Raritan Canal, which I have not in mind.

Secretary REDFIELD. That is all. The whole thing is of the greatest importance, and I think there is a general agreement.

The CHAIRMAN. The same thing is true as to the waterway south of Norfolk, is it not?

Secretary REDFIELD. Yes; we have a great national opportunity there which, up to date, we have neglected, an opportunity to shelter ourselves there from the outside and to run our own vessels from the north to the south and from south to north where nobody can get at them on the way. It is a great natural gift that God Almighty has given us, and we ought to use it, and we could do it for far less than the cost of the Panama Canal, and set ourselves free from anxiety.

Senator WEEKS. You have sent vessels connected with the Department of Commerce through that canal?

Secretary REDFIELD. Yes.

Senator WEEKS. You have to pay tolls on those at commercial rates?

Secretary REDFIELD. Yes.

Senator WEEKS. That is true also of the Navy?

Secretary REDFIELD. Yes; and sometimes we go to some expense in order not to do it.

Senator WEEKS. Do you know how much you have paid for tolls?

Secretary REDFIELD. No; I do not. I could give you that. The question of interrupting the canal during the war for the purpose of enlarging it would be a very serious one, Mr. Chairman, and possibly one that we ought not to think of without very grave deliberation, but I understand this bill to be a preliminary act, and I am speaking of it in that point of view wholly.

The CHAIRMAN. In other words, the present emergency does demand the deepening of the canal, but——

Secretary REDFIELD. But that demand can not be satisfied without closing the canal for months. Therefore I should think that would be a matter of a good deal of doubt. As it is, smaller vessels of war can pass back and forth, but not the large ships.

I have brought with me the Coast and Geodetic Survey chart, which illustrates very clearly the dangerous shoals, giving the soundings. This is chart 1107 of the Coast and Geodetic Survey. That illustrates the dangers now of the navigation It shows the Nantucket Shoals Lightship, and it shows this entire line, which is very dangerous. I thank you very much.

The CHAIRMAN. We are much obliged to you, Mr. Secretary.

Senator WEEKS. In reply to the inquiry from the department about the practicability of this project, the Secretary wrote you a letter which I would like to include, in addition to his remarks, as part of the record.

The CHAIRMAN. Very well. I think we have one also from the Secretary of War.

Senator WEEKS. I will put that in the proper place.

The CHAIRMAN. All right.

(The letter from the Secretary of Commerce referred to is here printed in full, as follows:)

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, May 24, 1917.

MY DEAR SENATOR: Referring to your communication of May 16, 1917, requesting my suggestions relative to the merits of Senate bill No. 2277, introduced in the Senate of the United States May 11, 1917, by Hon. J. W. Weeks, entitled: A bill "To enable the Secretary of War and the Secretary of the Navy to enter into negotiations for the purchase of the Cape Cod Canal, and for other purposes," you are advised as follows:

The proposal to make the Cape Cod Canal a Government-owned waterway has my most hearty approval. The canal, which was constructed by the Cape Cod Canal Co., was formally opened on July 29, 1914, and establishes a direct communication between the waters of Buzzards Bay on the south and those of Cape Cod on the north. It is 8 miles long and shortens the actual distance between Vineyard Sound and Boston by about 70 miles and eliminates all the danger to navigation in the waters of Vineyard Sound, Nantucket Sound, and Nantucket Shoals, where the sea has annually levied its toll of human life and property by wrecks caused by fog, treacherous currents, and shoals, some of which are composed of shifting sands. Available figures show an average annual loss, before the completion of the canal, of 50 vessels in navigating these dangerous waters.

All this danger is now avoided by the use of the canal. The commerce carried by the canal at the present time approximates 20,000,000 tons of freight and 500,000 passengers per annum, and 9,000 vessels passed through the canal during the period from August 1, 1914, to December 31, 1915, which are the latest figures available to me. I have every reason to believe that figures for the year 1917 will show greatly increased tonnage and a larger number of vessels.

In my opinion, the canal, under its present management, has not reached its maximum efficiency nor does it give the maximum service which a waterway at this place should give. I believe that the present owners have done everything which can be done under private ownership of a waterway of this class conducted for profit. With Government ownership of this canal, the condition would be different. The question of an individual profit could be eliminated. The great resources of the Government, both in money and means, could be made available

for the deepening, widening, and improving of the canal, so that the question of size of vessels using the canal would not be one of the deciding factors as to whether or not the canal would be of service on routes between certain seaports.

It is not too much to state that if the canal would furnish facilities demanded by all classes of vessels, that all traffic, both passenger and freight, between ports south of New York and Boston and other New England ports would use the canal with a consequent saving in time and the absolute elimination of dangers incident to the navigation of the waters outside of Cape Cod.

As a suggestion not relating particularly to the work of my department, Government ownership of the canal would be of the greatest strategic importance from a military standpoint, and it would give the Government absolute control of this important artery of commerce in time of war, so that it could be used primarily for national defense.

Very truly, yours,

WILLIAM C. REDFIELD, *Secretary.*

Hon. DUNCAN U. FLETCHER,
Chairman Committee on Commerce,
United States Senate, Washington, D. C.

The CHAIRMAN. I present a letter from Hon. Daniel Willard, chairman advisory commission of the Council of National Defense, for insertion in the record.

(The letter referred to is here printed in full, as follows:)

ADVISORY COMMISSION OF THE COUNCIL OF NATIONAL DEFENSE,
At Washington, May 29, 1917.

Hon. DUNCAN U. FLETCHER,
Chairman Senate Committee on Commerce,
Washington, D. C.

MY DEAR SENATOR FLETCHER: Circumstances, which I very much regretted, compelled me to be elsewhere yesterday during the hearing by your committee on Senate bill 2277, introduced in the Senate on May 11 by Senator Weeks, of Massachusetts, and having to do with certain contemplated negotiations looking to the ultimate purchase by the Federal Government of the Cape Cod Canal.

Upon the whole, it seems to me wise and desirable that the Federal Government should own and operate the Cape Cod Canal. My understanding of the matter is that the canal in its present shape, as regards depth and width, is available for only a portion of the maritime commerce of the north Atlantic coast, and that boats moving in that trade which are unable to pass through the canal are obliged to navigate the difficult and treacherous waters off Vineyard and Nantucket Sounds.

I am advised that statistics compiled by the Department of Commerce show an annual average commerce around Cape Cod of upward of 20,000,000 tons, with an annual loss of seven lives and 50,000 tons of ships and cargo. These figures in peace times would seem to justify the Federal Government in giving the matter careful consideration; but however valuable the canal may be from a purely peace and commerce standpoint, it seems to me that its value in times of war would be very much greater, and I refer to it particularly in that connection as a part of a scheme which, if carried out in its entirety—and which has been recommended, so I am advised, by the officers of the Army and Navy—would provide an inland and protected waterway for the ships of our Navy from Boston to some point far down the coast below the mouth of the Chesapeake Bay. This fact of itself, so it seems to me, gives the canal importance as a protective measure, quite apart from any value which it may have in times of peace and for purely commercial purposes.

I do not wish by anything I have said to minimize the importance of the canal as a channel of commerce; on the contrary, I am strongly in favor of any improvement or agency that can be created to facilitate the movement of commerce from points anywhere west of the Hudson River to the New England territory. The problem of getting into New England each year the coal that is consumed for domestic and manufacturing purposes is one which taxes to the limit existing facilities by rail and water. The use of the Cape Cod Canal in that connection would, I am told, save about 70 miles in distance each way for the majority of boats engaged in that particular business.

I take it there is no question concerning the importance of the canal from a purely peace-time and commercial basis, but it is rather from the standpoint of its importance as a protective measure that I favor and would urge its purchase by the Government.

I have no personal knowledge whatever concerning the cost or value of the canal, and have no views to express upon that phase of the question.

Very truly, yours,

D. WILLARD, *Chairman.*

Senator WEEKS. Now I would like to call on Hon. John N. Cole, who is chairman of the Commission on Waterways and Public Lands of the State of Massachusetts.

Mr. Cole will refer to the connection which the State has with the chartering of the canal and the issuing of securities.

STATEMENT OF MR. JOHN N. COLE, CHAIRMAN COMMISSION ON WATERWAYS AND PUBLIC LANDS OF THE STATE OF MASSACHUSETTS.

Mr. COLE. Mr. Chairman and gentlemen, in view of the questions, or some of the questions, it may be well for me to go briefly into the history of this canal, inasmuch as there seems to be some doubt about the manner in which it was created and how it was developed.

The CHAIRMAN. I think that would be well.

Mr. COLE. The State of Massachusetts, through many different bodies of citizens, has had a great interest in having this waterway created for many years, but it had never seemed to feel that it could stand the expense itself. You probably know, all of you, that Massachusetts has been pretty generous in her expenditures of money for the benefit of shipping of all kinds, having spent in the minor bays and harbors and various passages leading to them, since the creation of the board of which I am chairman, about $17,000,000 of her own money——

Senator RANSDELL. How many years was that?

Mr. COLE. Forty-odd years. Having in the last five years appropriated $9,000,000, some for the development of the port of Boston, and, in connection with the statement made by the admiral here, relative to the value of connecting Boston Harbor with Newport and getting the advantage of dry-dock service for war vessels, we should keep in mind that at the present moment we are building a dry dock in Boston Harbor at the expense of the Commonwealth, the best and biggest dry dock probably on the Atlantic coast, if not on any coast connected with the United States; and this afternoon we have a conference, one of several, with those in charge of the yards and docks providing for partial use of that dock by the United States Government.

Senator WEEKS. That is the only dock on the northern Atlantic coast large enough for the largest dreadnaught, is it not?

Mr. COLE. The only one. It can accommodate a vessel approximately 700 feet long.

The State of Massachusetts not feeling that it could bear this expense, in 1889 there was created a corporation known as the Boston, Cape Cod & New York Canal Co., which was given a charter by the Commonwealth, to build this canal.

In 1890, the year following, that act was amended, providing for the creation of a construction company which would be authorized to work with the Boston, Cape Cod & New York Canal Co.; and they together, having authority to issue stock and bonds under the provisions of law applicable in Massachusetts to such corporations to the extent of $6,000,000 in stock and $6,000,000 in bonds. The law in Massachusetts makes it necessary that no stock or bonds in connection with a corporation dealing in public service shall be issued beyond the actual value of work that may be done or service that may be rendered or material that may be put in, and that was cared for by having the harbor and land commission at that time—the predecessor of one part of the board which I represent—having control of the issuance of that stock, later the board being increased by adding to it, because railroad questions were involved, the public-service commission, they two making a joint board controlling the issuance of stock, and to direct the construction of this canal.

From time to time various issues of stock were allowed—or, rather, I am a little ahead.

In 1910 no work having been done, another act was passed compelling the Boston, Cape Cod & New York Canal Co. to begin work within three months and to complete the work within five years. There have been issued out of the $6,000,000 of stock and the $6,000,000 of bonds—and, by the way, with every issuance of stock there was a reserve, held back from the construction company by the joint board, of 10 per cent, so that at this time that has not been issued—there had been issued of that stock up to May 24, 1917, last Saturday, the last issue being a small issue of stocks and bonds in connection with the last estimate made by the engineer and approved by the engineer of our board who had been the approving and consulting engineer all through, $5,732,000 of stock and $5,740,000 in bonds; leaving unissued at this time $258,000 of stock and $260,000 in bonds.

The CHAIRMAN. You said the work was to be completed in five years. I presume that was extended?

Mr. COLE. There was a provision in that law requiring that the work should be completed in five years, but giving to the joint board the power to extend the period from time to time. Extensions have been made, and while the canal is completed,

at the present time there are at issue between the joint board and the canal company two or three points not yet definitely determined. One of those points has undoubtedly been determined by decision of the Attorney General, relative to the building of a lock which could have been required to be built at the time when the construction of the canal was beginning. It was not required. The opinion of the Attorney General of Massachusetts is that it can not be required at this time except by the issuance of proper stocks and bonds to pay for it.

Senator VARDAMAN. Are we to understand that you have invested in that canal something like $10,000,000——

Mr. COLE. They have invested in that canal, under the laws of Massachusetts——

Senator VARDAMAN (continuing). Actual money?

Mr. COLE (continuing). And approved by every safeguard put around those things in Massachusetts, $11,472,000, and about $500,000 more not yet approved.

The CHAIRMAN. And the lock now is said to be necessary, and how much will that cost?

Mr. COLE. There is a very grave difference of opinion as to that. The best authorities we can get say that the lock is not necessary. If the lock is necessary it is estimated to cost anywhere from $3,000,000 to $5,000,000.

Senator BANKHEAD. That is for the purpose of controlling the current, is it not?

Mr. COLE. Yes.

The CHAIRMAN. Where would it be placed?

Mr. COLE. Again, I think I should prefer to have an engineer answer that, but I doubt if any two might agree exactly. The question was asked with respect to passing places in the canal. This is in its operation at the present time a one-way canal. It is not, however, a serious hardship on coastwise traffic, except being shut up, several miles of it, to one-way service.

Senator SHIELDS. What is the length of that canal?

Mr. COLE. It is 8 miles long, and about 7 miles more of channel at the ends have been dredged.

The CHAIRMAN. You say the work was to be completed. That means, of course, that there was a definite amount of work to be done. In a general way, what was that work?

Mr. COLE. The cutting of the ditch, if we may call it that, through the land, 100 feet on the bottom and 200 feet on the top, 25 feet deep the entire distance. It would require the regrading of a great deal of the shore, the relocation of a number of highways, the construction of a number of bridges for railroad and highway travel, the creation of basins at either end now being used for passing places. Of course, there is a great deal of other work that would naturally follow.

The CHAIRMAN. At present what depth of water is being maintained in the canal at low water?

Mr. COLE. I think it is 20 feet; I am not sure, but it is 21 feet to 23 feet.

The CHAIRMAN. At low water?

Mr. COLE. Yes.

Senator BANKHEAD. How many bridges have you there that have to be opened?

Mr. COLE. That have to be opened?

Senator BANKHEAD. Yes.

Mr. COLE. We have two bridges that have to be opened.

Mr. MILLER. There are three—two highway bridges and one railroad bridge.

Mr. COLE. Yes; two highway and one railroad.

The CHAIRMAN. Was the railroad built there after the canal?

Mr. COLE. No; the railroad was there long before the canal came.

The CHAIRMAN. The railroad practically parallels the canal?

Mr. COLE. Yes; it does. It goes across and then runs down here [indicating on map].

Senator VARDAMAN. I understood you to say it was a one-way canal; that is, that ships did not pass but one way, with the tide.

Mr. COLE. The reason that it is a one-way canal has nothing whatever to do with the tide. The vessels of the Eastern Steamship Co. running from Boston to New York reached there almost to the minute every day in the year when they used it, and they used it practically all of last year; and no matter what the tide is, they go and come without any difficulty. Our investigation shows it to be a fact that with a vessel that can be navigated the tide has very little to do with it. It is a one-way canal because it is not wide enough and deep enough to give the service which is required by the immense coastwise traffic which would like to use it.

The CHAIRMAN. Then, ships arriving at one end have to telephone or advise the other end to stop ships coming through?

Mr. COLE. The management of the canal controls that situation by telephone service and messenger service.

The CHAIRMAN. Have you any way of controlling rates on the canal?

Mr. COLE. No, sir.

The CHAIRMAN. I thought maybe your board had something to do with the amount of the tolls.

Mr. COLE. No.

The CHAIRMAN. The State does not regulate that at all?

Mr. COLE. No.

Senator WEEKS. By a decision of the Attorney General that is made a national waterway, is it not?

Mr. COLE. Yes, sir.

Senator RANSDELL. I was going to ask if it was wise, in your judgment, for the Government to undertake the purchase of the canal and its enlargement?

Mr. COLE. I think it has been impressed on you by Admiral Benson and by the Secretary of Commerce what value that canal has to the Navy. Our board feels very keenly the importance of these small harbors of refuge, and feels that an even larger number would be better. We have felt it keenly enough to have appropriated $100,000 very recently to develop harbors in particular reference to the Coast Guard Service that may be established in connection with this war. The commercial feature of it is of tremendous importance, and while it may not justify an emergency act of appropriation, we have established by the State at New Bedford a State pier, with the design that they should bring cotton from the South directly to that pier and give a service to the big cotton mills at New Bedford that they can not get in any other way, by a direct line between New Bedford and southern ports. Already that has shown itself to be of such value that we believe that with that same type of shipping, not alone confined to cotton, giving us a closer connection with the country south of New York, which at the present time is the great receiving port for the products of the South, and extending those southern steamship lines up to a direct connection with the city of Boston, we would feed the people of New England on the products of the South double what we do at the present time, and we would make a direct connection between the enormous manufacturers of New England and the South.

Senator RANSDELL. And you would avoid those dangers?

Mr. COLE. Yes; no question about it; and also there is the economy of the service to be rendered.

Senator WEEKS. That means economy in both time and money?

Mr. COLE. In both time and money.

Senator CALDER. How much time do ships save in going from New York to Boston by the use of that canal?

Mr. COLE. At certain times they would go from New York to Boston or from Boston to New York in a night's journey; but with the fogs that used to hold them outside there were days and days when they did not get there until 12 or 1 or 2 o'clock in the day; so that by having the inside service they would probably save 50 per cent of the time. The fogs are very serious all down through this route.

I think, however, that the most important feature of that is involved in the expense that is put upon the shipping by the tolls that are charged on the canal; not unreasonable—according to all figures, very reasonable tolls—but tolls that do make such a burden that they drive the average shipper outside in order to avoid the expense. The Government is the only party that can afford to widen and deepen and carry free that service for the biggest coastwise shipping that the United States knows anything about.

Senator BANKHEAD. I know that you have not got the figures here, but could you give any estimate as to the amount, in bulk; how many dollars would it cost the average coastwise ship to go through that canal?

Mr. COLE. I am very sure that they have the data here, and they will give them to you.

Senator BANKHEAD. I would like to know.

Mr. COLE. It is a range of prices per ton.

Senator WEEKS. Would you like that answer now, Senator?

Senator BANKHEAD. No; I do not want to interrupt the gentleman.

Senator WEEKS. Mr. Austin, the president of the Eastern Steamship Co., is here, and he can give you those figures.

STATEMENT OF MR. CALVIN AUSTIN, PRESIDENT OF THE EASTERN STEAMSHIP CORPORATION.

Mr. AUSTIN. It is $402 for our passenger ships; $800 per night, one going each way.

Senator WEEKS. How large are those ships?

Mr. AUSTIN. Four thousand seven hundred gross tons; 300 feet long and 50 feet wide.

Senator WEEKS. How many passengers will they carry?

Mr. AUSTIN. We are limited to 600. We run from 250 to 500.

Senator WEEKS. Did you go around the cape before this service was opened?

Mr. AUSTIN. Yes, sir; I have operated that line there, freight and passenger, since 1905. From 1907 we have put two ships on there, the Yale and the Harvard, which were built especially for that route, and operated them outside; but it was not a practical proposition, on account of the very rough weather and the fogs and the detention. When the canal was opened last year we put on the Massachusetts and the Bunker Hill, two high-powered twin-screw ships, capable of making 22 knots, and we operated them from May 20 to October 1.

Senator VARDAMAN. What was the amount that you paid in tolls?

Mr. AUSTIN. Last year we paid $125 each way, which would be $250 per night. Now tolls have advanced to $402 per night each way, which would be $804 a night.

Senator VARDAMAN. How many trips do you make?

Mr. AUSTIN. Two trips daily and Sunday.

Senator VARDAMAN. Daily?

Mr. AUSTIN. Yes.

Senator VARDAMAN. That is a pretty heavy toll.

Senator WEEKS. Can you make that service regularly through the canal so that you reach your destination at the appointed time?

Mr. AUSTIN. I will not vary 20 minutes. Vessels going out make it in 13½ hours, and going the other way in 16½ to 18 hours.

Senator WEEKS. It is very irregular going outside?

Mr. AUSTIN. Very irregular, and very rough and dangerous.

Senator VARDAMAN. Do you want to finish this morning, Mr, Chairman? I have got to be down in the Senate in a few minutes. I am interested in the bill which is up this morning.

Senator WEEKS. What is your wish, now, about this, Mr. Chairman? There are quite a number of gentlemen here who will make very brief statements. I would like to have them heard as soon as the committee can accommodate us.

Senator VARDAMAN. Can we not come back at 2 o'clock? I would like to hear what they have to say, but I would not think of delaying these gentlemen or the committee on my account. I am obliged to be on the floor of the Senate. This food bill is before the Senate now.

Senator WEEKS. Yes.

The CHAIRMAN. Before we take a recess we can hear one more witness.

Senator WEEKS. I would like to have Mr. Cole finish his statement.

Mr. COLE. I think I have finished.

The CHAIRMAN. Mr. Austin, will you state whom you represent?

Mr. AUSTIN. My name is Calvin Austin, and I am president of the Eastern Steamship Corporation.

The CHAIRMAN. I would like to have you state, if you know, what the toll is per ton on coastwise shipping that goes through that canal?

Mr. AUSTIN. It varies. The ships that I run take the highest tolls, I think, eight-tenths and a fraction per gross ton. In addition to these two passenger ships I run I have seven more I could put through there provided the canal was in condition so that I could operate them through there. The canal is not wide enough and not deep enough, and for that reason we can not run what we term our freight ship through there, which is a single screw ship drawing about 21 feet. They go very near the bottom. A ship drawing 21 feet when going at speed will settle down 1 to 2 feet, and as soon as she picks up the bottom she takes a sheer and goes into the side of the canal, which one did last year.

The CHAIRMAN. I understood you to say the toll was about 80 cents a ton?

Mr. AUSTIN. Yes.

The CHAIRMAN. How many tons would those ships carry?

Mr. AUSTIN. That is on the gross tonnage?

The CHAIRMAN. Yes.

Mr. AUSTIN. We do not carry so much freight through there on those ships—about 800 tons. But our freight ships would carry 1,500 tons.

Senator BANKHEAD. That is 1,500 gross tons?

Mr. AUSTIN. No; that freight ship going through there, the gross tonnage would be 2,700 tons. That is ship measurement per cubic foot.

The CHAIRMAN. How much would that cost you?

Mr. AUSTIN. I do not think that ship, Senator, takes the 8 per cent rate. Somewhere between $200 and $300.

Senator. BANKHEAD. That is all I wanted.

Senator CALDER. Do you have any trouble operating your ships because of the tide?

Mr. AUSTIN. No, sir; that is simple enough. The wheel turns very rapidly, and it is practically like an automobile. You can hold the ship right on.

Senator WEEKS. That is because it is a twin screw?

Mr. AUSTIN. A twin screw. With the single screw we do not dare to operate there. We handle a million tons of cargo, and if that canal was in condition so that we could go through there, we would go. Instead of leaving New York at 5 o'clock in the afternoon and getting to Boston the next afternoon at 2 or 3 o'clock, with a freighter, we would get in there between 9 and 10.

Senator VARDAMAN. Let us recess until half past 2 o'clock, and I think this food bill will be disposed of by that time and we can come back.

Senator WEEKS. Will you give a written guarantee?

Senator VARDAMAN. No; I will not give a written guarantee, but we can read the proceedings here anyway, if we do not hear them.

Mr. AUSTIN. I would like to suggest to the Senator here that the gross tonnage, which costs $200 on the basis of a gross tonnage of 2,700 tons, carries about 1,200 to 1,500 tons of freight, and if you divide that 1,500 tons of freight into that, you have a cost per ton of the freight of $15 to $17 per ton on that freight.

The CHAIRMAN. Will it suit you, Senator Weeks, to meet at half past 2, when we will hear the rest of the witnesses? All the members of the committee will not have to be here, but those who can be here will be here and we can go on at that time.

Senator WEEKS. We would be very much obliged if the committee would meet again at half past 2.

The CHAIRMAN. Without objection, that will be done.

(At 12.10 o'clock p. m. the committee took a recess until 2.30 o'clock p. m.)

(After recess.)

The committee reconvened at 2.30 o'clock p. m., pursuant to a recess taken, Hon. Duncan U. Fletcher (chairman) presiding.

Senator WEEKS. Mr. Chairman, I am going to ask Mr. Blodgett, who represents the Boston Chamber of Commerce, to be the next speaker.

The CHAIRMAN. All right; we can proceed, although all the members are not here. Mr. Blodgett, give your name to the stenographer.

STATEMENT OF MR. EDWARD E. BLODGETT.

Mr. BLODGETT. My name is Edward E. Blodgett; I am here representing the Boston Chamber of Commerce.

The matter, Mr. Chairman, was brought up before the Boston Chamber of Commerce a short while ago, and the committee on maritime affairs had a number of hearings on it, and we finally made a report to the executive committee and the board of directors. I do not know whether that report has been filed here or not. I have a copy of the report, which was given me, which I will be glad to file. Will you have that printed, Mr. Chairman?

Senator WEEKS. It is a short report, and I would like to have it printed.

The CHAIRMAN. Very well, it will go in as a part of the proceedings.

(The report referred to is here printed in full, as follows:)

MAY 17, 1917.

To the Executive Committee and Board of Directors:

The committee on maritime affairs recommends that you favor the taking over of the Cape Cod Canal by the Government, if satisfactory terms can be agreed upon.

COMMERCIAL AND STRATEGIC VALUE OF THE CANAL.

The canal itself is 8 miles long, 100 feet wide, and 25 feet deep. It brings Boston 70 miles nearer to New York, Philadelphia, Norfolk, and other Atlantic ports. Besides its commercial value to Massachusetts and New England, it is becoming recognized that the canal should be of considerable strategic importance from a military standpoint, and expenditure of money by the Nation to enlarge and develop it at this time would likely be considered justifiable.

The canal in its present condition can not be used by the larger type of vessels and is considered unsafe for boats with a draft in excess of 20 feet. The shipping now using the canal consists chiefly of moderate-sized steamers, tows of barges, two and three masted schooners, yachts, and other similar craft.

At the meeting of the committee it was brought out that many other vessels, notably steamers in the South American trade, steam colliers, steamers of the Merchants & Miners Transportation Co., and others might use the canal if its width and depth were increased and the present toll rates reduced.

In its program of defense the Government would probably wish to widen and deepen the canal so as to accommodate vessels of the Navy, and if enlarged to a width of 200 feet or more and to a depth of 35 feet, which it would have to be in order to accommodate the larger vessels of the Navy, the canal would then be sufficiently large to accommodate any of our merchant vessels.

RECOMMENDATIONS OF THE COMMITTEE.

Believing that Government ownership would hasten these improvements, the committee is strongly of the opinion that it would be to the interests of the port of Boston and its shipping if the Government were to take over the canal; and the committee recommends that the chamber favor its purchase by the Government provided that the owners of the canal are willing to offer it to the Government at a reasonable figure. (See appendix.)

Respectfully submitted.

COMMITTEE ON MARITIME AFFAIRS,
WILLIAM C. BREWER, *Chairman.*
EDWARD E. BLODGETT.[1]
JOHN G. CROWLEY.
RICHARD R. FREEMAN.[1]
ARTHUR P. FRIEND.
CHARLES H. MAYNARD.
FRANK B. MCQUESTEN.
CHARLES STEWART.
WILFRID O. WHITE.[1]

"APPENDIX.

"The Boston, Cape Cod & New York Canal Co. was incorporated in accordance with the provisions of chapter 448 of the acts of 1899 and chapter 476 of the acts of 1900. These acts authorized the company, when formed, to issue not exceeding $6,000,000 of stocks and not exceeding $6,000,000 bonds, and authorized the company to make a contract for the construction of the canal and to pay for its construction in stocks and bonds of the company.

"Chapter 519 of the acts of 1910 appointed a board of railroad commissioners and the harbor and land commissioners a joint board with power, among other things, to authorize the company to issue stocks and bonds from time to time as the construction of the canal progressed.

"After the canal company had spent some amount in preliminary plans, surveys, etc., and had issued $10,000 worth of stock to enable it to pay for these preliminary plans and surveys, it advertised for bids, the contractor to be paid in stocks and bonds of the canal company. The only bid received was that of the Cape Cod Construction Co., which offered to construct the canal according to specifications and to accept in payment therefor $5,990,000 worth of stocks and $6,000,000 worth of bonds.

"The acts incorporating the company have authorized the canal company to pay for the construction of the canal in its own stocks and bonds, and the canal company, having advertised for bids and having accepted the lowest (and only) bid, the joint board (railroad commission and harbor and land commission) did not believe the question of whether the stocks and bonds of the company were worth par, or what their amount of value was, to be before them, and considered that the only question before them when they were petitioned by the company to approve the issue of stocks and bonds, was whether the progress which had been made in constructing the canal was such as to warrant the issuance by the company of the proportion of stocks and bonds which it at that time requested authority to issue.

"The Cape Cod Construction Co., we understand, made a contract with the Degnon Cape Cod Construction Co., under which the latter company did most of the work of constructing the canal. How the latter company was paid and how much it was paid we do not know."

Mr. BLODGETT. It then went to the executive committee, and the executive committee, after a considerable discussion, approved the report of the maritime committee, and that was then finally approved by the board of directors, and they have asked me to appear here in behalf of the bill.

The chamber of commerce is made up of about 5,000 members of all classes of men from all lines of business, not confined to maritime membership at all, of all kinds of commercial business, and lawyers.

[1] Messrs. Blodgett, Freeman, and White have not had an opportunity to pass upon this report.

The point that the committee and the board of directors took specifically in this matter was that they did not want to take any position with reference to the amount that should be paid for this canal. There has been some talk in Boston, and also in some of the newspapers, that the bill was an attempt to foist a poor investment onto the United States, and our chamber of commerce distinctly takes the opposite point of view. Their position is that they believe that the canal is a good thing for the public and for New England and for the country, and that it should be taken and operated and owned by the Government. The question of price does not enter into it, and they are no party in any way, shape, or manner with reference to any price that may be put upon it or how the price shall be got at which the Government shall pay for it.

We have about 10,000,000 tons of coal going annually around Cape Cod. If that tonnage can come through the canal, it will save a great amount in time, distance, and expense, and in these times, when there is danger of submarines, a great many owners would not let their boats go around the outside route, outside of Cape Cod, because that is the most exposed place on the whole coast to submarine attack, while, if they could go through the canal and up inshore, the tonnage would go freely and without difficulty, and the owners would let it go.

The CHAIRMAN. You say there are about 10,000,000 tons of coal?

Mr. BLODGETT. Yes; of coal.

The CHAIRMAN. Where is that moving from?

Mr. BLODGETT. From Norfolk to Boston and ports in the vicinity of Boston and Portland. That is outside of other commodities which are carried there also.

The CHAIRMAN. Coming from Norfolk to Boston, would that be a great deal of saving?

Mr. BLODGETT. It would save approximately from 75 to 125 miles, depending on which route you took. If you go around through Nantucket Sound, it saves about 75 miles; and if you go around outside, by the outside route, as we call it, it saves from 125 to 140 miles, and from my experience as a lawyer I can say that more of our collision cases and more of our accidents come from going over the shoals and around the back side of Cape Cod, as we call it, than in any other part of the northern Atlantic, on account of the conditions of the bottoms and the shoals, on account of the danger on the back side of Cape Cod and Nantucket in storms; and if they can come up through Buzzards Bay and through the canal they escape practically nine-tenths of the storms which they have over the shoals and over the outside of Cape Cod.

On the question of the amount of tolls that are charged going through there, the charge has been approximately 8 to 10 cents a ton with coal-carrying vessels. To me and to Mr. Rossiter the great trouble with the canal in its present ownership and for mercantile commerce is that it is not in condition for vessels carrying 2,500 to 3,500 and 5,000 tons of coal to navigate through it in safety except on the very top of the tide. At other times of the tide it is not in condition for them to navigate in safety, and for that reason they can not use it, and, of course, that makes the burden on vessels like Mr. Austin's passenger steamers that he spoke of almost prohibitive for them to go through.

There have been a number of methods spoken of for fixing the canal so it could be operated safely, and so that it could be commercially used, as well as for the Government vessels, and one of those methods that has been proposed has been to line the canal on the edge of the deep-water canal, namely, 100 feet in width, with piles put in bunches, three or four together, some 20 or 25 feet apart, so that if a vessel took a sheer, as they do and when they what is called "smell the bottom," they could not sheer onto the sloping banks and onto the ripraps, with which those sloping banks are lined, and could not be injured in that way.

Then, too, in our opinion, it is of the utmost importance to New England and the northern coast to have the canal in such condition, and so kept, that the warships and battleships can be operated through it, especially so with respect to the dry dock Boston is now building.

The CHAIRMAN. What amount of commerce passes clear outside—outside both of these routes here—going north and south [indicating]? Ships coming to Boston from about this direction here [indicating] had just about as well continue around outside instead of going through here, had they not?

Mr. BLODGETT. Yes; but if you had a contour of the shore you would see that the only ships to go outside there would be the ships coming from abroad.

The CHAIRMAN. The ships coming from our own ports——

Mr. BLODGETT. They would not go outside. They would come up inside there [indicating].

The CHAIRMAN. I did not know whether any of them kept entirely outside or not.

Mr. BLODGETT. The deep-draft vessels have had to go outside.

The CHAIRMAN. For instance, the Clyde Line; what route would they go?

Mr. BLODGETT. They would go up inside.

The CHAIRMAN. Inside?

Mr. BLODGETT. Through the slough.

Senator WEEKS. The president of the Clyde Line is here and will state the reasons for that, Mr. Chairman.

The CHAIRMAN. Yes.

Mr. BLODGETT. The report of the executive committee, which I will file, states shortly what I have said, namely, that the canal in its present condition can not be used for the larger type of commercial vessels. No vessel can use that at the present time, as I understand, at all times of the tide, which draws more than 20 feet of water; and, of course, that limits the use that the canal can be put to very materially.

The recommendation that was adopted by the Boston Chamber of Commerce is as follows:

"Believing that Government ownership would hasten these improvements, the committee is strongly of the opinion that it would be to the interests of the port of Boston and its shipping if the Government were to take over the canal; and the committee recommends that the chamber favor its purchase by the Government, provided that the owners of the canal are willing to offer it to the Government at a reasonable figure."

Senator VARDAMAN. Has this stock company ever offered this to the Government at any price?

Senator WEEKS. I think not. The Government has had no authority to purchase, anyhow.

Senator VARDAMAN. I know; but have they made any proposition?

Senator WEEKS. Not that I am aware of.

Mr. BLODGETT. I think this question of the Government taking it originated because people who have been watching the canal and watching what was being done with it have realized what a tremendous advantage to the country in time of peace the canal would be and could be if it were widened and straightened and deepened and properly protected as the Government would do it. They also realize at the present time—and New England is pretty wide-awake at the present time, on account of her exposed condition—that it is a tremendous advantage in time of war, because submarines can not get in to interfere with ships going through that canal. All along the south shore the bottom is sandy and the water shoals off very slowly and it would be impossible for a submarine going under water to get in within striking distance of any vessel going on that route. The deep water where they have got to go is farther off, but on the outside route they would go and lie in wait and attack anything and everything that came around that way; and those are the reasons, the main reasons, why the Boston Chamber of Commerce, which I represent, feel that this bill ought to be passed and it is extremely important for it to be passed.

Senator VARDAMAN. Have you had put in the record—I have not been here, and if you have I do not want to ask a repetition—the probable saving to the commerce in freight?

Senator WEEKS. That has not been put in but it will be.

Senator VARDAMAN. That will be put into the record?

Senator WEEKS. Yes; that will be put in.

Senator VARDAMAN. That is a very salient fact with me.

Senator WEEKS. Mr. Chairman, I will ask Mr. Lethbridge, president of the Maritime Exchange of New York, to address you next.

STATEMENT OF MR. EDGAR E. LETHBRIDGE, PRESIDENT OF THE MARITIME EXCHANGE OF NEW YORK CITY.

Mr. LETHBRIDGE. Mr. Chairman and gentlemen, my reasons for advocating this measure are as follows: I am not qualified to speak as an expert in navigation or construction. My line is particularly marine insurance, and more particularly inland marine insurance, which applies to inland waters and canal waters, and I advocate the Government controlling these waters for the reason that the Government now controls the operation of all vessels. In other words, in order to operate a vessel she must first pass a Government inspection. The captain of that vessel and the other officers, the engineers also, have to pass a Government inspection before they are qualified to operate. But the waters in this case are not under the operation or control of the Government, and I should think they ought to be together—that is, the two interests are so identically the same that the Government should control.

One of the speakers this morning referred to the fact that the State of Massachusetts had spent, I think, about $40,000,000, or appropriated for the improvement of waterways. The State of New York has spent, or will have spent on the completion of the present barge canal, about four times that amount, in other words, about $160,000,000;

and it opens up another thing, that there is a type of boat which we classify as a box, that is used particularly in carrying coal and also grain cargoes in New York Harbor. Now those vessels can not be insured to operate going around Cape Cod, they are not suitable for outside waters, but they can be insured to carry cargoes from New York and through the canal. Owing to their construction they are not fit to operate outside, and therefore, more especially for bulk cargoes, it makes it much cheaper.

You take an ordinary small type of canal boat, it is equal in carrying capacity to about 10 railroad cars of coal, of the small 300-ton type, and, of course, barges run up 3,500 tons capacity.

I do not know that I could add any more to it, except that your insurance rate from New York to Boston via the canal would be cheaper than outside.

Senator WEEKS. How much cheaper?

Mr. LETHBRIDGE. Probably 30 to 40 per cent cheaper.

Senator WEEKS. You are familiar with rates; suppose you were going to insure the passage of the boats of the Eastern Steamship Co. going by the route they are now following, how would the rate compare with that on steamers going outside?

Mr. LETHBRIDGE. I doubt, in the case of the Eastern Steamship Co.'s vessels, whether it would make any material difference; but it would make a great difference in the class of vessels that can utilize the canal, that now ordinarily go around Cape Cod, and would not be insurable going around, which the underwriters would insure.

Senator WEEKS. Before the canal was opened there was something like 6,000,000 gross tons going around the cape a year?

Mr. LETHBRIDGE. Yes.

Senator WEEKS. Assuming that all of that originates in New York and goes to Boston—which, of course, it does not—if it went around the cape what would the rate average?

Mr. LETHBRIDGE. I should say it would average close to 1 per cent.

Senator WEEKS. If it went through the canal what do you think the rate would average?

Mr. LETHBRIDGE. Probably from 60 to 75 cents.

Senator WEEKS. How much of a saving would that be on $6,000,000?

Mr. LETHBRIDGE. That is a mathematical problem. I mean, it is the difference between 60 cents and a dollar, which is 40 per cent saving.

Senator WEEKS. You think that would stand the test?

Mr. LETHBRIDGE. I think that is about right.

The CHAIRMAN. You mean 60 cents on the dollar per ton?

Mr. LETHBRIDGE. No; that would be 60 cents per $100 of value.

The CHAIRMAN. Per $100 of value?

Mr. LETHBRIDGE. Yes.

The CHAIRMAN. What would that amount mean on the tonnage?

Mr. LETHBRIDGE. You can hardly figure it on the tonnage basis, because the values would vary. For instance, a cargo of coal would be worth a certain amount, whereas if it was a cargo of grain it would be increased again, and so with a cargo of cotton; and along those lines there is one other thing I want to say. Some one mentioned this morning that there might be created an inland waterway connecting ports through Chesapeake Bay and Delaware Bay, and perhaps on up to Boston. I would say, go even farther than that. I do not see why cotton should not be loaded in Charleston or in Savannah and, by an adequate system of waterways, taken through Albemarle Sound and Pamlico Sound, so that you would have practically an inland waterway from the South to the North.

Senator WEEKS. Do you come here with authority from the Maritime Exchange?

Mr. LETHBRIDGE. I do not come here at the direction of the exchange, but I might add that a large percentage of our membership, and it has nearly 1,000 members, advocate this measure, and also that our board of directors are favorable to it.

Senator WEEKS. They are favorable to it?

Mr. LETHBRIDGE. Yes.

The CHAIRMAN. Mr. H. H. Raymond will address the committee now.

STATEMENT OF MR. H. H. RAYMOND, PRESIDENT OF THE CLYDE STEAMSHIP CO. AND THE MALLORY STEAMSHIP CO.

Mr. RAYMOND. Mr. Chairman, this subject has been so well discussed here, and I am so thoroughly in accord with the views expressed both by Admiral Benson and by the Secretary of Commerce as well as those who followed, that there is little that I can say except that, for our companies, we indorse all that has been said and advocate in the strongest possible terms the Government taking over this canal. We have operated through it with more or less success, and we have had to abandon it on account

of, sometimes, tolls, when the low rates of freight would not permit us to pay the tolls, and at other times it has been out of commission due to accidents. But, on the whole, it is a wonderful thing for commerce, and it should be, in my judgment and the judgment of those who are associated with me, taken over by the Government.

The CHAIRMAN. Your boats go by what route now?

Mr. RAYMOND. We go in where you see Vineyard Sound on that map. We go by Gay Head. It is on that chart.

The CHAIRMAN. You go through Vineyard Sound?

Mr. RAYMOND. Yes; through Vineyard Sound and over the shoals.

The CHAIRMAN. Through Nantucket Sound and out by here [indicating on map]?

Mr. RAYMOND. Yes; and we experience the same sort of weather that has been spoken of here; rough, fogs, and currents. Whereas through the canal you can come in from outside on a very foggy day and as soon as you get in behind the head of land you find clear weather, and you carry that clear weather with you until you are through the canal, and from there you have a straight course to Boston.

The CHAIRMAN. How about the practicability of navigating clear outside—by Nantucket Island?

Mr. RAYMOND. That is too long a distance. None of the coast boats do that.

Senator VARDAMAN. How many ships do you operate?

Mr. RAYMOND. In my own office I think there are 52 or 54 ships.

Senator VARDAMAN. Do they ply between——

Mr. RAYMOND. No; we only operate about four going to Boston from the South.

Senator VARDAMAN. And what would be the saving in freight of your boats if you had free access to this canal and it were sufficient in depth and width to carry your boats?

Mr. RAYMOND. The saving would be more in insurance and in the time than in the rate of freight. There is a distance there of about 70 miles of saving, which to an ordinary freighter means about seven hours, and that frequently means a day, because you may arrive in the night, when in the other case you would arrive in the morning.

Senator VARDAMAN. What would the saving be to the people, the patrons of your line—the commerce—by the completing of that canal?

Mr. RAYMOND. In dollars and cents, as to freights?

Senator VARDAMAN. Yes.

Mr. RAYMOND. I doubt if there would be any, to be frank about it, because the cost of transportation is the terminal cost, largely, and it is like getting on a street car—it does not cost you much, and you can not figure the cost from one block to the other. This is only a short distance—70 miles—as compared with a thousand.

Senator VARDAMAN. Just from your statement I would judge that the only people who would be benefited by this would be the steamboat people.

Mr. RAYMOND. No; I do not think that, Senator. There would be a great saving of life and property, a great saving of insurance, and possibly some saving in the rates. That would have to be determined later.

Senator WEEKS. Mr. Raymond, suppose you save 100 miles in distance going around there, how much does it cost you to run one of your boats 100 miles of the type you run there—from the South to Boston?

Mr. RAYMOND. The transportation cost of that type of ship is about a dollar a mile. No; I am wrong about that. It is a dollar for the distance.

Senator WEEKS. A dollar for the distance?

Mr. RAYMOND. Yes.

Senator WEEKS. Then you would save $100?

Mr. RAYMOND. Yes.

Senator WEEKS. Each trip?

Mr. RAYMOND. Yes.

Senator WEEKS. How many trips do you make a year?

Mr. RAYMOND. Fifty-two.

Senator WEEKS. Then you would save on each steamer an actual running expense of $5,200?

Mr. RAYMOND. Yes.

Senator WEEKS. To say nothing of the time and the insurance?

Mr. RAYMOND. We would save time, which to the class of freight that we carry is very important, because in the wintertime it is food products, consisting of fruits, largely, and the difference in arriving in Boston as we did arrive going through the canal, in the morning, and as we do arrive on the longer and rougher route, in the afternoon, will frequently mean a difference of 24 hours in our deliveries.

Senator VARDAMAN. You would save by going through the canal about one-third of the time, would you not?

Mr. RAYMOND. No, sir. We run from New York to Charleston and Jacksonville.

Senator VARDAMAN. Oh, yes.

Mr. RAYMOND. We would save about 14 hours on each voyage; that is all.

Senator VARDAMAN. How much time does it take?

Mr. RAYMOND. It takes 60 hours to Charleston and 70 hours to Jacksonville.

Senator VARDAMAN. That is about 20 per cent, is it not; 15 to 20 per cent?

Mr. RAYMOND. Yes.

Senator VARDAMAN. I would think that would reduce the cost of the freight somewhat.

Mr. RAYMOND. It would; it may be port to port rates. Those rates are made on the relative basis with the whole country.

Senator WEEKS. You would consider that the most dangerous part of the route from Boston to Jacksonville, would you not?

Mr. RAYMOND. I regard it as the most dangerous part of the Atlantic coast, right from the St. Croix River to the capes of Florida.

Senator WEEKS. Have your steamers ever been aground there?

Mr. RAYMOND. Yes.

Senator WEEKS. How often?

Mr. RAYMOND. I think once only since I have been with the Clyde line.

Senator WEEKS. Did you lose the steamer?

Mr. RAYMOND. No; we got her off, but she was there for several months.

Senator WEEKS. How much did it cost you?

Mr. RAYMOND. Roughly, I should say $50,000 or $60,000, but I have just forgotten.

Senator WEEKS. How long have you been president of the company?

Mr. RAYMOND. Since 1907. That is, I have been president of the company since 1914 and vice president of the company since 1907.

Senator WEEKS. Then it has cost you $6,000 or $7,000 a year to get your steamers off the ground there?

Mr. RAYMOND. Yes.

Senator CALDER. You operate the run through from Boston to Jacksonville without any intermediary points?

Mr. RAYMOND. From Boston to Charleston and Jacksonville.

Senator CALDER. You do not stop at New York?

Mr. RAYMOND. No, sir; and then we operate some in the winter. Prior to the war, when cotton was active, we operated from Galveston to Boston. That was special service during the winter season only.

Senator CALDER. Do you operate any service between New York and Boston?

Mr. RAYMOND. None whatever.

The CHAIRMAN. Then you have a line from New York to Jacksonville?

Mr. RAYMOND. Yes; we have a line from New York to Jacksonville; and that line connects with the Eastern Steamship Co. and with the railroads from the East, so that we have to Jacksonville, Fla., and to the Southeast, practically five sailings a week, including the Boston sailing.

Senator WEEKS. Do you know any shipping men, pilots, or any other seafaring men who are opposed to this proposition?

Mr. RAYMOND. I think they are all in favor of it, every one that I have heard speak of it. I can not conceive why they would not be, because, as I stated in the beginning, you come from foul weather into fine when you come in from the outside to those inland waters, and you carry that weather until you are within a few hours of your port.

The CHAIRMAN. You have used the canal some?

Mr. RAYMOND. Yes; we used it.

The CHAIRMAN. But the high tolls have caused you to discontinue the use of it?

Mr. RAYMOND. We discontinued it when they had the accident in there with a coal ship.

Senator WEEKS. How much water do those steamers that you run to Boston draw?

Mr. RAYMOND. We do not undertake to go through there with a draft exceeding 20 feet. Whenever they drew more than that, we went outside.

Senator WEEKS. Is there anything further?

Senator CALDER. Just a minute. You heard Mr. Austin testify that the tidal current did not affect his steamers going through the canal?

Mr. RAYMOND. That was our experience. We had the power; and I think an average captain going through there with a single screw steamer would prefer to have an adverse current on account of the bridges.

Senator WEEKS. Would it make any difference whether the steamer was twin screw or single screw?

Mr RAYMOND. It is safer with a twin-screw boat, very much; yes, sir.

The CHAIRMAN. In regard to the saving of time, of course, we can readily see the saving of distance, but does it not take a great deal longer time to go that 12 miles there than to go 40 miles down here [indicating on map]?

Mr. RAYMOND. Not that ratio, Senator.

The CHAIRMAN. No.

Mr. RAYMOND. No; especially if you go through there with a 5-knot current. Then you are going through there pretty near as fast as your ship would go under steam; pretty nearly as fast as you would go out the other side.

The CHAIRMAN. Does not that delay about the bridges interfere very much?

Mr. RAYMOND. No, sir; we never had any complaint of it; they handle those very nicely.

I overlooked the fact in my statement that we operated from the West Indies to Boston and up here. Those are rather deep draft boats, and we have never sent any of them through the canal, and if the canal were deepened we could use it with those vessels as well as the outside route.

Senator VARDAMAN. I suggest that all these gentlemen be allowed to add anything to their statements, in the way of facts, that they please, so as to complete them before they are printed.

The CHAIRMAN. Yes. They may do that.

Do you take in Vineyard Sound?

Mr. RAYMOND. We take in Vineyard Sound and come around the shore there indicating on the map].

Senator WEEKS. Thank you, Mr. Raymond.

STATEMENT OF MR. EBEN S. S. KEITH.

Mr. KEITH. Mr. Chairman and gentlemen, I come here as a citizen of Massachusetts. I am a Cape-Codder, born and brought up right alongside of that canal, operating a manufacturing plant there, and in my lifetime I have had the opportunity of becoming very familiar with the whole of the land of Cape Cod, and having been in politics for six years I started up at Boston Light and came on down through in that particular district when I was on the governor's counsel.

I have also been fishing a great deal and I know the whole shore of Cape Cod I could not tell you the soundings, but I know the currents, and I know what the old sea captains tell me, and they are friends of mine, and the younger men, too. They consider—men who have been coastwise all these years and have retired—that there is no particular coast that is so dangerous as this coast around here [indicating on the map].

They also tell me—it may be right or may be wrong, I do not wish to criticize any man, and I do not think they do either—that the money that the Government is spending on Pollock Rip Slough, as they call it, which is off the end of Monmonoy Point—there is a terriffic current there; there is no question about that; you have a full sea from there to the west coast of Africa and there is nothing in front of you, and the bottom is absolutely of sand, and of shifting sand—and they think as the result of a lifetime of observation that money spent there is not of permanent benefit, and I have confidence in their judgment.

Through this route here [indicating on map] there is no shifting sand and mud and clay, because you do not get the wash. On the north side, here is where I live, right up here at the east end of the canal; the wash there is wholly taken care of by a jetty about 3,200 feet long, I think it is, that the canal company has built on the west side, and the shifting sand is all away to the eastward, and it is so all the way down the east side of the cape.

I have been interested in the testimony given this morning. I do not think enough prominence has been given, perhaps, to this. There is no place on the Atlantic coast where the danger is so great as here. I spent four years as a telegraph operator reporting newspaper work—that was when I was a younger man—and the wrecks and the loss of life has been something terriffic, and I have not got it tabulated—I wish I had——

Senator WEEKS. We will put in the record, before we finish the hearing, a record of the wrecks and the loss of life.

Mr. KEITH. Yes. I am interested in this way, too, from the standpoint of commerce. I know perfectly well the saving of ships and of life can be effected by this route.

So far as the current goes, and the operation of the canal goes, I want to add this to the record, that four weeks ago this morning I saw one monitor, three submarines, and one destroyer go through the canal—one right after the other— followed by several schooners and several coal barges. Now, the Navy would not operate through there unless they had some reason for a saving short cut from Newport to the New York Navy Yard.

I do not know that I can say any more. I do not want to put in a lot of cumulative evidence.

The CHAIRMAN. What is the character of the country through which that canal runs?

Mr. KEITH. It runs through a narrow valley.

The CHAIRMAN. Sandy?

Mr. KEITH. Yes; it is sandy, with some bowlders. I watched the construction of the canal from the time they s arted, and they have made a good job of it, and they have left a margin with the idea of widening it, and it requires it, because it requires a deeper draft. The use of the canal by the Navy now, regardless of the tows, in war times makes it worthy of the consideration of this committee.

The CHAIRMAN. The larger vessels of the Navy can not go through there now?

Mr. KEITH. No; those that went through drew only about 20 feet.

Senator VARDAMAN. You do not think that the canal charges would have anything to do with keeping submarines out of that canal, do you?

Senator WEEKS. Not when we are appropriating $3,500,000 in one lump. [Laughter.]

Senator VARDAMAN. I thought that might have something to do with it.

Mr. KEITH. Away down in here they have had to dredge [indicating on map]. Through there [indicating] they have had no difficulty. I could not tell you what draft the vessels were that have been through there.

The CHAIRMAN. How is the depth of water at the east entrance?

Mr. KEITH. You run right off in here into deeper water. Here is 30 feet, and 35 feet here [indicating on map]. It runs off into deep water.

The CHAIRMAN. The committee will next hear Mr. O. H. Hageman.

STATEMENT OF MR. O. H. HAGEMAN, MARINE DEPARTMENT, PHILADELPHIA & READING RAILROAD.

Senator WEEKS. Mr. Hageman, you represent the marine department of the Reading Railroad?

Mr. HAGEMAN. Yes; the Philadelphia & Reading Railroad.

Senator WEEKS. What does that consist of?

Mr. HAGEMAN. We have 12 ocean tugs and 60 barges carrying coal from Philadelphia to Boston and to points east.

Senator WEEKS. How many tugs have you sold to the Government?

Mr. HAGEMAN. Not any, yet.

Senator VARDAMAN. What was that?

Senator WEEKS. I asked him how many tugs he had sold to the United States Government.

Mr. HAGEMAN. Not any, yet. We expect to lose some of them.

With all the 10,000,000 tons of coal transported to Boston we carry a fraction less than 2,000,000 tons. We have used the canal not, perhaps, as much as we might have done, but sufficient to demonstrate the advantages and possibilities in the event of its being deepened and widened. That seems, in our judgment, to be the most important feature.

Senator WEEKS. You go through the canal with tows?

Mr. HAGEMAN. Yes.

Senator WEEKS. Of how many barges?

Mr. HAGEMAN. Three.

Senator WEEKS. Without any trouble in handling them?

Mr. HAGEMAN. No; we have never had any trouble. It necessitates an additional tugboat to go up through there; and when I say "no trouble," I mean we have had no trouble and no expense—no extraordinary expense. Of course it is necessary under existing conditions to take extraordinary precautions while using tugboats; but that would be eliminated, we think, if the channel of the canal was deepened and widened.

Senator WEEKS. When do you use the canal and when do you not use it?

Mr. HAGEMAN. That has been optional with our masters, generally. We have left it to them. Of course we expected to use it more extensively, but owing to the fact that they have had an accident or two that interfered with us and that some of our barges have a little deeper draft than they thought, so that frequently with a tow of three barges one of them would be a deep-draft barge, we have not been able to use the canal so much as we otherwise would.

Senator VARDAMAN. Several gentlemen have mentioned the accident that interfered with commerce in the canal. What was that accident, and what was the cause of it?

Senator WEEKS. Mr. Hageman probably can not tell you definitely about that.

Mr. HAGEMAN. I do not know about the vessel. They have had a vessel sunk in the channel. Of course that stopped traffic for a time.

Senator WEEKS. As I understand it, the bow of this vessel struck the bank and the stern swung around, and before they could get it clear it sank.
Senator VARDAMAN. Yes.
Senator WEEKS. Your coal is all hard coal?
Mr. HAGEMAN. No, sir; about 50 per cent is hard coal.
Senator WEEKS. How much is the cost of a ton of coal as you transport it, through the canal?
Mr. HAGEMAN. I could not give you those figures.
Senator WEEKS. Take a barge that you would haul through there; how much would you carry?
Mr. HAGEMAN. Our vessels average 1,500 tons of coal per barge.
Senator WEEKS. One thousand five hundred tons?
Mr. HAGEMAN. They run from 1,500 tons to 3,000 tons.
Senator WEEKS. Taking a 1,500-ton barge, what would be the toll?
Mr. HAGEMAN. I think our tolls, on the round trip, cost us about $550 for the round trip.
Senator WEEKS. Per barge?
Mr. HAGEMAN. No; three barges; 4,500 tons of coal for the round movement.
Senator WEEKS. About $200?
Mr. HAGEMAN. Yes.
Senator WEEKS. What do you mean by a round trip on coal? You do not bring coal south?
Mr. HAGEMAN. I think the charge was 8 cents loaded, and I think 5 cents light.
Senator WEEKS. That is about 14 cents a tons for coal?
Mr. MILLER. I have the rates here, and I can give that to you.
Mr. HAGEMAN. It is 8 and 5—it is 5 cents and 3 cents, I guess.
Mr. MILLER. It is 5 cents one way and 3 cents the other.
Senator WEEKS. That is 8 cents, and if all the coal that goes to Boston, or goes to the north of Cape Cod, went through the canal, that would cost $880,000 a year.
Mr. MILLER. Ten million tons of coal go up there.
Mr. HAGEMAN. Eleven million tons are the figures I have for 1912.
Senator WEEKS. It would cost $880,000 a year, which would be that much tax on coastwise commerce?
The CHAIRMAN. If it all went that way.
Senator WEEKS. Yes; if it all went that way.
Mr. HAGEMAN. It could not all go that way under existing conditions.
Senator WEEKS. How much will it facilitate your business to have that canal widened and deepened?
Mr. HAGEMAN. Under the tests that we made, under existing conditions which were not at all favorable and not to be considered the conditions that should obtain, we saved on the trips east from 8 to 10 hours, between the outside and the inside routes.
Senator WEEKS. Ten hours?
Mr. HAGEMAN. Yes.
Senator VARDAMAN. What would that save to the people? What would the patrons who consume the material that you use, or that you haul, be saved?
Mr. HAGEMAN. That would depend entirely, I think, upon whether or not the saving in the transportation of the coal was actually saved to the consumer.
Senator VARDAMAN. If you saved time and reduced the peril and all that it would necessarily result in reducing your freight rates and the insurance and all that, would it not?
Mr. HAGEMAN. Yes; ordinarily.
Senator WEEKS. I will take another viewpoint—Senator, excuse me.
Senator VARDAMAN. All right; go ahead.
Senator WEEKS. You haul from New York or Philadelphia?
Mr. HAGEMAN. We haul coal from Philadelphia.
Senator WEEKS. How long does it take from Philadelphia to Boston?
Mr. HAGEMAN. About 78 hours.
Senator WEEKS. About 78 hours. What do you charge a ton?
Mr. HAGEMAN. The rate now is about $1.25.
Senator WEEKS. What is it in normal times?
Mr. HAGEMAN. These are normal times with us. We have not advanced that rate.
Senator WEEKS. $1.25 per ton?
Mr. HAGEMAN. Yes.
Senator WEEKS. Then if you saved 10 hours on a 78-hour run, that would be about 12 per cent in time?
Mr. HAGEMAN. Yes.
Senator WEEKS. And 12 per cent of $1.25 would be 15 cents?

Mr. HAGEMAN. We would figure that your total saving of 12 hours would mean $250 to us, as we regard it.

Senator WEEKS. Do you mean for a tow or a barge?

Mr. HAGEMAN. For a tow of the whole.

Senator WEEKS. $250?

Mr. HAGEMAN. Yes.

Senator CALDER. Do the tidal conditions in the canal bother you, going through?

Mr. HAGEMAN. They did, somewhat. That was what made it necessary—practically what made it necessary—to use an extra tug, you know, to get through. There is some difference as to the tide. Some say it runs 5 knots, and some say it runs 3, and some say 6.

Senator NELSON. Can you give us any information as to the amount of shipping that passes through the canal now or in the navigation season?

Mr. HAGEMAN. No, sir; I can not.

Senator VARDAMAN. That will be put in the record. It has all been testified to.

Senator NELSON. It has?

Senator VARDAMAN. Yes.

Senator WEEKS. I will have those figures put in the record, Senator, by one of the witnesses who will come later.

Senator NELSON. And they also charge tolls, do they not?

Senator WEEKS. Yes.

Senator NELSON. And will you also include the tolls charged?

Senator WEEKS. Yes.

Senator NELSON. And the rate of income from tolls?

Senator WEEKS. Yes.

Senator CALDER. Do you operate any vessels between New York and Boston?

Mr. HAGEMAN. No, sir.

Senator WEEKS. Is there anything more?

Mr. HAGEMAN. No, sir.

Senator WEEKS. Thank you, very much.

The CHAIRMAN. The next witness to be heard will be Mr. L. D. Dow.

STATEMENT OF MR. L. D. DOW, NEW YORK CITY.

Senator WEEKS. Do you represent the American Merchant Marine Association?

Mr. DOW. I represent the American Merchant Marine Association. That is composed of officers of coastwise towboats. I represent also the American Steamship Licensed Officers' Association, which has eight different coastwise lines—the deck officers—eight principal coastwise lines of passenger steamers.

Senator WEEKS. What have you to say about this?

Mr. DOW. All of the officers of the ships that I speak about and which I represent absolutely believe in the Government ownership of the Cape Cod Canal, for this reason: It will save, under ordinary circumstances, 70 miles of distance, and many times it might save the loss of their ships, or might save two weeks' time, because I myself have been in the Vineyard, lying two weeks and could not get around Cape Cod. They believe that if the Government owned the canal it would be in such shape that any kind of a merchant vessel could go through there, and any kind of a Government vessel.

The loss of life has been very great there; it is a very dangerous place, and I have myself laid in the Vineyard there two weeks with sailing vessels, and with tows, and we could not get around the cape.

Another thing, oftentimes you will have a thick fog around the cape where you can go up inside all right. The records will show that.

Senator WEEKS. There is much more fog from the end of the cape than there is in Massachusetts Bay?

Mr. DOW. I represent the officers of the ships of the line that Mr. Raymond is president of, and what he has forgotten to say is that they have a great many ships coming from the West Indies with sugar, bound to Boston, say the Ward Line, and the New York and Porto Rico line, and I represent the officers of all those ships, and they believe it would be a great saving of their work.

Senator VARDAMAN. Captain, do you think it would be a great saving to the people, the consumers, by the reduction of freight rates, if the Government owned this canal?

Mr. DOW. Absolutely; no question about that, sir, because the cheaper that stuff can be gotten around there the cheaper it can be sold to me as a consumer. But I am particularly interested in the wear and tear on the ships and the men by the navigation—the necessity of navigating around old Cape Cod. They consider that the worst place. They do not except Hatteras at all; they consider that the worst place on the coast.

Senator VARDAMAN. That is to be considered, safety and expedition, and all that; and I do not see why it should not bring about a great reduction in freight rates.

Mr. DOW. There is no question about that, sir; because, as I tell you, the best ships that you have in the United States at times can not get around Cape Cod on account of a northeast snowstorm, the heavy sea, and so on.

Senator WEEKS. I think I can corroborate your statement about lying in Vineyard Sound, because the last time I had anything to do with taking a vessel around there we were two days in Nantucket Sound; had to anchor there two days and lost all that time, whereas if the canal had been open and had been deep enough for the ship, we could have taken it through the canal and saved that time.

Mr. DOW. There is no question about that at all. Now, of course I am particularly interested in the licensed officers. I know what it is to navigate around old Cape Cod.

Senator WEEKS. All these shipping interests you represent have no interest in the canal?

Mr. DOW. No; they are simply sailors.

Senator WEEKS. That is all right.

Mr. DOW. No, sir; I have named them to you. They are the New York & Porto Rico Steamship Co., the New York & Cuba Mail Steamship Co., the Clyde, the Mallory, the Southern, the Old Dominion, the Savannah, and the Southern Pacific Co. They all send ships there.

Senator WEEKS. Suppose you put a pilot on a ship from New York to Boston, would the charge for pilotage be less if the ship went through the canal than if it went around the cape?

Mr. DOW. Surely.

Senator WEEKS. How much?

Mr. DOW. That I could not answer. The distance would be so much shorter. You might put a pilot on a ship going around old Cape Cod, and he might be a week or two weeks getting around, under bad conditions, where he might go through the canal straight.

Senator WEEKS. It would depend on the time, how much was charged?

Mr. DOW. Surely.

Senator WEEKS. Then, we would have, as the saving, the matter of time and insurance and the cost of running the steamer?

Mr. DOW. Absolutely. You would save all the way from 70 miles to two weeks' time; you can not tell.

Senator VARDAMAN. And there would be a saving of life?

Mr. DOW. Absolutely; there is no question about it.

Senator VARDAMAN. I am very glad that you have taken some account of that. Nobody is thinking of saving life now.

Mr. DOW. One of the gentlemen sitting here, who testified to-day, one of his boats went ashore there, and the barges and seven lives, I think, were lost. He forgot to speak about that.

Senator WEEKS. We will put in the record the number of lives and the amount of shipping lost.

Mr. DOW. It is very great; I have always feared Cape Cod more than any other part of the coast. Sometimes you think you are by and you start to run, and run right on the bottom.

Senator CALDER. Do the men you represent sail ships from New York up the East River?

Mr. DOW. The men I represent come from South America and the West Indies.

Senator CALDER. I know; but I want to ask you this; Do you think it very important that the channel from the East River into Long Island Sound should be widened and deepened, through Hell Gate?

Mr. DOW. I think every improvement that you make in the East River and Hell Gate is a godsend to the traveler and the navigating public.

Senator CALDER. It is pretty dangerous there at times?

Mr. DOW. Absolutely. You have got to know your business going through there.

Senator CALDER. You have read in the papers about the torpedo boat which was carried ashore there?

Mr. DOW. Yes. Anything goes wrong with your steering gear, and you are right ashore in a minute. Every improvement there is a godsend to the public; and I think it is for the Government to own that canal. You could send your commerce, your merchant vessels, and your Government vessels through that canal, and it would be a great saving; and they would go clear of a great many dangers besides storms and fogs, submarines, etc., that you might have in time of war, when they

must go outside of Cape Cod and can not go in the canal. And as for an inland water way, I am entirely in favor of it.

Senator CALDER. I quite agree with you, and I am glad to hear you speak of that.

Mr. DOW. Yes. Anybody who has followed the business knows that.

The CHAIRMAN. You may proceed now, Mr. Buchanan.

STATEMENT OF MR. I. S. BUCHANAN, SUPERINTENDENT OF FLOATING EQUIPMENT, LEHIGH & WILKES-BARRE RAILROAD CO. OF NEW YORK.

Mr. BUCHANAN. The company that I represent is engaged in transporting interstate coal only between New York and eastern ports, such as Boston, Salem, and Newburyport.

We are engaged in towing tows of three barges around the cape, and we have been using the Cape Cod Canal; but after investigating the waterway thoroughly, we had to abandon it for the simple reason that we did not consider it safe to take loaded barges through there on account of the draft of water. The saving in time was very great for our company. For instance, in 1915, before we used the canal, we lost 102 days awaiting favorable weather to go around Cape Cod. At that time we had to lie in Vineyard Haven awaiting favorable weather.

In 1916 we lost 98 days waiting to get around the cape. It takes us, with all weather conditions favorable, with a tug and three barges, to run from New York to Boston, 42 hours. Going by way of the Cape Cod Canal we have run it in 28 hours.

Senator VARDAMAN. Let me ask you right there: The trouble that occurred in the canal, that interfered with your passage through it, has not that been removed?

Mr. BUCHANAN. It has been removed; yes, sir; but it was there quite a long time—some months.

Senator VARDAMAN. How much water do your barges draw?

Mr. BUCHANAN. They draw from 15 feet to 22 feet. We have some barges that draw 15 feet, and we have barges that draw, I think, 22 feet; and very often one of those 22-foot barges will be one of a tow of three barges, the other two barges drawing only 15 feet. Therefore, we can not go through the canal with that tow, but have to go around the cape.

I want to call your attention to one passage here in the journey around the cape which nobody has called attention to, and that is getting around Pollock Rip. You notice there are some very sharp angles there [indicating on map].

The CHAIRMAN. Almost right angles.

Mr. BUCHANAN. Yes. A tug and three barges passing around that point, the stern barge will be where my finger is [indicating on map] and the next barge and the tow will be at the point, and the third barge in tow will be around the point, and the tug will be ahead of her.

Going around the point there the weather often will be clear, and within a very few minutes a thick fog will shut in, and we have to trust to luck to get out.

Senator VARDMAN. How long is your tow of three barges?

Mr. BUCHANAN. The barges are 200 feet long and the hawsers between them vary from 75 fathoms to 125 fathoms each—6 feet to a fathom.

The CHAIRMAN. Have you not plenty of leeway here at this point [indicating on map]? You are not obliged to take that route up there, but you can take this route [indicating]?

Mr. BUCHANAN. That is the route we take [indicating on map].

The CHAIRMAN. You can not go at right angles like that [indicating]?

Mr. BUCHANAN. That is what we do.

The CHAIRMAN. Can you not go around here [indicating on map]?

Mr. BUCHANAN. No, sir; we go on these shoals. The tide sets in so strongly there that it carries us right on those shoals on the Pollock Rip.

The CHAIRMAN. What is the distance between these shoals?

Mr. BUCHANAN. I could not tell you offhand, sir.

The CHAIRMAN. You do not know what it is?

Mr. BUCHANAN. It would show on the chart, and you could tell it from that accurately.

Senator WEEKS. Senator, the water is so shallow there; of course, there is a channel, but you can almost see the bottom on the sides going through. It is a very narrow passage. Of course, it is not narrow in the sense that there is exposed land, but on the rips there, I do not know just how much water there is, but not, of course, enough for a vessel to pass over.

Senator VARDAMAN. Why is that called a "rip;" because it rips everything up?

Mr. BUCHANAN. The water ripples over it all the time, and the sand is continually changing. One day it will have 15 feet of water over it and the next day 25 feet. It keeps shifting back and forth all the while.

The CHAIRMAN. From this map it looks like a feasible route there [indicating on map].

Mr. BUCHANAN. Of course, we round the corners a little more than what is shown there; but, as I illustrated there, that is practically the position of a tug and three barges passing around that point [indicating].

Senator VARDAMAN. Have you any idea that if that canal was made satisfactory—sufficiently wide and sufficiently deep—it would result in the lowering of freight rates?

Mr. BUCHANAN. What, sir?

Senator VARDAMAN. Do you think it would result in lowering the freight rates?

Mr. BUCHANAN. Yes.

Senator VARDAMAN. Would it make coal cheaper to the consumer?

Mr. BUCHANAN. Yes.

Senator WEEKS. What is the charge on a ton of coal from New York to Boston?

Mr. BUCHANAN. What do you mean, the toll?

Senator WEEKS. Yes.

Mr. BUCHANAN. Five cents.

The CHAIRMAN. You mean that is the canal toll, 5 cents?

Mr. BUCHANAN. Five cents loaded and 3 cents light, passing back, on the gross tonnage of the vessel—not the carrying capacity, but the gross of the vessel?

Senator WEEKS. What is the hauling charge on a ton of coal from New York to Boston?

Mr. BUCHANAN. They figure it at about 50 cents a round trip.

Senator WEEKS. Then, if you saved one-third of the time going through the canal, you could make substantially that time?

Mr. BUCHANAN. We would make just that much more delivery of material.

Senator WEEKS. It would increase your delivery nearly one-third?

Mr. BUCHANAN. Yes. At the present time, when the Government is taking over our vessels and crippling us for power, it would be a very great advantage.

Senator WEEKS. Has the Government taken over your tugs?

Mr. BUCHANAN. They have listed them all. They will probably call for them in time.

Senator WEEKS. How much coal do you haul to Boston?

Mr. BUCHANAN. Last year it was 375,000 tons to Boston.

Senator WEEKS. And how much to the coast north of Boston?

Mr. BUCHANAN. That included Portland and Salem.

The CHAIRMAN. I do not quite understand that. Fifty cents a ton—which way?

Mr. BUCHANAN. They charge 58 cents a ton to tow a ton of coal from New York to Boston; and light, they charge you 24 cents light. In other words, if a barge went east at 50 cents——

The CHAIRMAN. You do not come back loaded?

Mr. BUCHANAN. No; light. We carry nothing but our own products. That means that a barge of 1,500 tons to tow around to Boston would pay 50 cents; and coming back, 24 cents, although she did not have a ton in her. That would be on her carrying capacity.

Senator WEEKS. How long have you been doing that business?

Mr. BUCHANAN. Twenty-five years.

Senator WEEKS. How many barges have been lost in that time?

Mr. BUCHANAN. Two, and one tug.

Senator VARDAMAN. Where did you lose them?

Mr. BUCHANAN. We lost one off Chatham and another off Shinnecock—it does not show on that map—and another tug in Salem.

Senator VARDAMAN. You never lost any on Pollock Rip?

Mr. BUCHANAN. No, sir; we have had them ashore there time and time again, but got them off.

Mr. Hageman has testified here that last year he lost a whole tow, three barges, and lives—I think 12 men all told—a total loss.

Senator WEEKS. How many times have you had vessels ashore there?

Mr. BUCHANAN. I could not tell you, but a great many. Every once in a while we have them ashore. They get caught in there with those tows and the tide sweeps them over on those shoals. It is not like a single vessel that is under complete control. You have to straighten the barges behind you and keep the whole tow from going ashore.

Senator WEEKS. You have been at a great deal of expense?

Mr. BUCHANAN. Yes; very great expense.

The CHAIRMAN. How much water do your barges draw?

Mr. BUCHANAN. Sixteen feet.

The CHAIRMAN. You assume, from the standpoint of every shipping man, that the deepening and widening of the canal and its ownership by the Government would improve and cheapen coastwise transportation?

Mr. BUCHANAN. There is no question about that so far as the Eastern States go. All their raw materials would be just that much reduced.

The CHAIRMAN. To accommodate your purposes, how deep and how wide should the canal be?

Mr. BUCHANAN. At least 500 feet wide.

The CHAIRMAN. And how deep?

Mr. BUCHANAN. Twenty-five or 30 feet would be plenty for our commercial purposes.

Senator VARDAMAN. That would not be wide enough for the naval purposes?

Mr. BUCHANAN. No, sir; I am speaking from the standpoint of the sea towing and nothing else.

Senator VARDAMAN. Is there anything further?

Mr. BUCHANAN. No, sir.

Senator VARDAMAN. All right, then; let us have some one else.

The CHAIRMAN. Mr. Gerry L. Brooks desires to be heard and we will now have him address the committee.

STATEMENT OF MR. GERRY L. BROOKS, REPRESENTING THE CHAMBER OF COMMERCE, PORTLAND, ME.

Mr. BROOKS. I am representing the Portland Chamber of Commerce here. Perhaps it would be well for me to read this telegram before I commence my statement. I just received this from the executive secretary of the chamber of commerce. It was sent following the meeting of the board of managers this morning:

PORTLAND, ME., *May 28, 1917.*

GERRY L. BROOKS,
New Willard Hotel, Washington, D. C.

Our harbor committee and chamber believes that Cape Cod Canal of vital importance to coastwise traffic and as war emergency project. It should be owned and operated by Federal Government and dredged and widened to handle all commercial and war traffic. Ownership should be assumed by Government condemnation proceedings.

W. B. MOORE,
Executive Secretary, the Chamber of Commerce.

Senator VARDAMAN. I notice that telegram says "by condemnation proceedings." Why, if the Congress should determine to buy the canal could the Government not buy it without condemnation proceedings?

Senator WEEKS. The bill provides that the Secretaries may enter into negotiations with the canal company and arrive at a price if they can, and if they can not, then they may proceed with condemnation proceedings.

Senator VARDAMAN. That is all right.

Mr. BROOKS. I might say that we are sufficiently far removed from this canal to be free from any influence. We are looking at this from a purely commercial or military standpoint and feel that, viewed from either standpoint, the Government would be entirely justified in taking over the canal. It would be useless for me to undertake to supplement what has already been said along those lines, and it may be a waste of time to undertake to go into the merits from the commercial standpoint, but it is well known and must be well known to this committee that a large part of the freight, more particularly coal and other commodities, reaches northern New England by water, so that we have an immense tonnage coming into Portland, which is the coal-distributing point for a large portion of not only Maine, but New Hampshire and northern Vermont; so that we have a great deal of tonnage in there, and this matter has been under discussion for some time back. So that we feel that the tendency in using the canal will be not only to cheapen freight rates, but to lessen dangers; and something else that perhaps is of much importance to the business man, and that is to avoid delays; so that if they make a shipment of freight, whether it is coal or package freight, or whatever it may be, from New York, we can tell with a reasonable degree of certainty when it will arrive in Portland.

I have not prepared any data or statistics on the Nantucket Sound, because I have assumed that those in charge would prepare that, and probably that will be filed with the committee.

As yet, I think nothing has been said by way of figures of the number of foggy days during the year over the Sound. It is surprising to see the number of days in which

vessels of all kinds are tied up in the Sound. That necessarily increases the cost of transportation, and it causes a great deal of inconvenience on account of delays.

Now, if I may change from that, I might say at this point that I am general counsel for the American Association of Masters, Mates, and Pilots, and working for them during the past seven years I have realized more than ever before the disadvantage of shipping going over Nantucket Sound. We have a great deal of trouble and have had a great many conferences with the Department of Commerce, and we realize that they are doing everything they can to aid shipping going over there. The rules require moderate speed in a fog going over the Sound. Towboats going in one direction and steamers either overtaking or meeting these tows, get into a tangle that is almost unbelievable to a man that has not been on the Sound and seen it; and on the Sound in a dense fog I have passed through when it seemed almost impossible to get over there without collisions. It should be known to the committee that in Pollock Rip Slough, where the current runs crossways of the channel, it is very narrow, and a good many ideas have been advanced as to bettering conditions there, and I think they started in a few years ago to dredge to make a straight line through but that for all practical purposes has been discontinued for the present, at least, and I think that every licensed officer is in favor of opening up the Cape Cod Canal for general navigation.

We have here the president of our association, who has spent his entire life on the water, and can give you all the details of the Sound.

The CHAIRMAN. What is your business?

Mr. BROOKS. I am practicing law; I have been practicing maritime law for the past 10 years.

The CHAIRMAN. You represent the masters, mates, and pilots?

Mr. BROOKS. The masters, mates, and pilots; yes, sir.

The CHAIRMAN. Do you know whether the commercial use of the canal is falling off or increasing?

Mr. BROOKS. I have not the figures on that; the general understanding is, I think, that the commerce is increasing.

The CHAIRMAN. Some of the committee seemed to be concerned about what effect that would have—that improvement there by the Government, the taking over the canal and improving it—on the freight rates. Do you know about that?

Mr. BROOKS. My personal opinion would be that it would tend to cheapen freight rates; and that is the reason why the chamber of commerce of Portland are indorsing this, because they thoroughly believe that the tendency will be to cheapen freight rates, and to shorten the time of delivery, as well as to eliminate danger both to life and property.

Senator WEEKS. Did you say that the president of the Maritime Association is here?

Mr. BROOKS. Yes; Capt. Pruett. I think he could give you a great deal of valuable information. Capt. Pruett, do you care to make a statement?

The CHAIRMAN. Proceed, Capt. Pruett.

STATEMENT OF MR. JOHN H. PRUETT, PRESIDENT OF THE NATIONAL MARITIME ASSOCIATION OF MASTERS, MATES, AND PILOTS.

Mr. PRUETT. In regard to this proposition of the Government taking over the Cape Cod Canal, representing the licensed officers who navigate the vessels that go east, we feel that if the Government took the canal and widened and deepened it, it would make it a waterway on which the traffic could pass and repass. Of course, it is dangerous now to go through there with a vessel coming the opposite direction, unless they are two small vessels. Two large vessels or two ordinary-sized vessels could not pass in the canal with any degree of safety.

But to go down over the shoals and around up by Cape Cod, there is always a degree of danger, I do not care what the weather is. You may run down to the Pollock Rip and have very nice weather, and before you get down to the lower end you will go into a misty, foggy condition, so that you can not see a quarter of a mile, and when you get to Pollock Rip you can not see half the length of your vessel. That condition prevails much less on the inland waters. I was given this information by one of the men at the Cape Cod Canal. He said their condition of fog there was only 45 per cent of what it was off Chatham and Pollock Rip. In other words, it is foggy twice as much down in the lower part of the shoals as it is in the upper part of Cape Cod Bay. Once you get started over the shoals it is not a very nice place to anchor, you can not anchor with any degree of safety, and anywhere down by the lower end you have to go on until you get into deep water and clear. But anywhere up by Buzzards Bay you can anchor any time you desire, if the fog shuts in, and when the fog lifts you can go on. I know there is no man that navigates between New York and Boston and any

of the southern ports, which carries them around Cape Cod, but what would prefer going through the canal a great deal more than having to go around the shoals.

Senator WEEKS. What would be the charge that a pilot would make for a 5,000-ton vessel from New York to Boston through the canal?

Mr. PRUETT. I do not know what the charges are through the canal, but they charge $75 down over the shoals.

Senator WEEKS. What do you think it would be through the canal?

Mr. PRUETT. I think they would let a man go through there for $40. The pilot's charge would be substantially twice as high over the shoals as through the canal.

Senator WEEKS. Yes.

Mr. PRUETT. That is because a man might be three or four days making the trip over the shoals.

Senator WEEKS. That is, he bases his compensation on the trip?

Mr. PRUETT. Yes.

Senator WEEKS. However much time it might take?

Mr. PRUETT. Yes. Going through the canal almost any pilot would expect to make his trip within 24 hours. To go down over the shoals no man would expect to make it in much less than three days.

Senator WEEKS. Is that charge based on the size of the ship?

Mr. PRUETT. Largely; yes, sir. Of course, with small ships it would be much less. I am speaking now of about a 5,000-ton ship. It was only the other day that the pilots agreed to take 5,000-ton ships around to Boston over the shoals for $75 and his fare back. That ship was a light ship. If she drew more water, so that he would have to go out over what we call Great Round Shoal, he would probably want $100, because that carries him so much farther outside and is so much longer trip.

The CHAIRMAN. Is that down this way [indicating on chart]?

Mr. PRUETT. That is what we call the southeast channel; just about the way you have drawn with your pencil there [indicating on map].

The CHAIRMAN. That is a good deal longer distance?

Mr. PRUETT. Yes; it brings it down to 17 miles, going by Pollock Rip.

Senator RANSDELL. Could you state what percentage of the commerce there now uses the canal?

Mr. PRUETT. No, sir; I do not know.

Senator WEEKS. We can state that by a witness who will take the stand shortly.

Is the sentiment universal in favor of the Government taking this canal and widening and deepening it?

Mr. PRUETT. Yes; for the reason that we believe that the Government should take over the canal. It would be better able to expend what money is necessary to widen and straighten it as much as possible, and to make the water much deeper.

Senator WEEKS. Do you know of any opposition to it?

Mr. PRUETT. I have never heard of any; not among the licensed officers. Is that all?

The CHAIRMAN. I think that is all.

Senator WEEKS. Thank you very much.

The CHAIRMAN. We will now hear Mr. J. C. Reichert.

STATEMENT OF MR. J. C. REICHERT, PRESIDENT OF THE REICHERT TOWING LINE (INC.) BROOKLYN, N. Y., REPRESENTING NEW YORK BOAT OWNERS AND THE NEW YORK TOWBOAT EXCHANGE.

Mr. REICHERT. I represent the New York boat owners, 250 of them, who own 1,500 scows, barges, and coal boats, a class of boats which never went below Providence before the canal was built. Now they are sending those boats down through there, regularly, and I have gotten data of one concern here which sent in one year 124,903 tons, and paid tolls amounting to $6,581 to take that coal through there. Those coal "boxes" are not fit to go outside of those capes, and they do take them down there through the canal with a large amount of coal. That is, a small shipper. We did not get any data from our other owners who send practically a whole lot more down there, and I was going to call on one man at the last moment to come down here, but I did not see him. I have not much to say.

The owners there are heartily in favor of the Government taking over this canal. I do not know much about it. I never was down there.

The CHAIRMAN. Without this canal those boats could not operate there at all?

Mr. REICHERT. No, sir; they could not. They would not think of going outside of the capes.

Senator RANSDELL. Where are those boats from?

Mr. REICHERT. They are from all the coal ports around New York, and the difficulty they have now with the ocean-going tug is that the tugs that go outside of those capes now are very scarce, and as you know, the Government is taking a lot of our coal boats, a large part of them, now.

The CHAIRMAN. Where did they discharge their coal before the canal was completed?

Mr. REICHERT. These barges?

The CHAIRMAN. Yes.

Mr. REICHERT. Around New York Harbor and Newport and New Haven, and around those places. We are using harbor boats now to take coal to Boston that never took it any other places but in harbor.

The CHAIRMAN. From point to point in the harbors?

Mr. REICHERT. Yes; from point to point in the harbors. They went to Providence and New Haven. Providence was their farthest point east. Now they are going to Boston and paying the charge for tugs for towing through that canal. They are small boats that are not fit for going around the cape. They take them through that canal and right up to Boston.

Senator RANSDELL. What do you have to pay through the canal for a ton of coal, do you know?

Mr. REICHERT. No; I do not.

Senator RANSDELL. You have not that information?

Mr. REICHERT. Here is a boat called the *R. M. Feeney*, loaded with 950 tons of coal through the canal, which paid $47.50 and coming back $15.45.

Senator WEEKS. It has been testified that the charges are 5 cents a ton loaded and 3 cents coming back light.

Senator RANSDELL. Then, I will not ask that question.

Senator WEEKS. That would make the total charge 8 cents.

Mr. REICHERT. I heard one gentleman make the assertion here that they would have to close the canal in order to dredge it, widen and deepen it. That seems unnecessary to me, from the fact that at the narrowest point you have 100 feet on the bottom and 300 feet on the top. Those dredges can work on one side and deepen one side and then go over to the other side, and you would never have to stop vessels going through that canal because of dredges working in it. At Newtown we have only a couple of hundred feet, and in Hell Gate the dredges work there, and they had only 60 feet clearance. They dredged there right along. So it seems to me that if the Government took over the canal they could keep on going through there while dredging was being done. I would like to submit a statement to the committee, and they can look it over. That would give them an idea of what small shippers do. Only a small portion of the coal, I know, goes down there.

(The following papers were submitted by Mr. Reichert:)

JAMES HUGHES, Jr.,
GENERAL TRANSPORTATION AND TOWING,
New York, May 26, 1917.

Mr. J. REICHERT,
Care of the New Willard Hotel, Washington, D. C.

DEAR SIR: I inclose you a list of tonnage I have passed through the Cape Cod Canal, covering a period of from May 1, 1916, to April 30, 1917, showing a total of 124,903 tons and tolls paid amounting to $6,581. No part of this tonnage would have gone in this class of a boat via the outside route. You might further state that I am only a small shipper compared to the large companies, and if individuals that own this canal at the present time feel like discontinuing the operations it would increase the cost of coal to New England buyers at least $2.50 per ton, as more expensive tonnage would have to be used and which is very scarce via the outside route.

Yours, very truly,

JAMES HUGHES, Jr.

NEW YORK BOAT-OWNERS' ASSOCIATION (INC.),
New York City, May 23, 1917.

SENATE COMMITTEE ON COMMERCE,
Washington, D. C.

GENTLEMEN: The New York Boat-Owners' Association (Inc.), the 150 members of which own and operate more than 2,500 commercial boats, i. e., tugboats, coal barges, grain boats, scows, lighters, covered barges, etc., aggregating 1,250,000 tonnage, respectfully urge that the Government acquire by purchase the Cape Cod Canal, owned by the Boston, Cape Cod & New York Canal Co., for the following reasons:

First. Its strategic value in time of war.

Second. In order that it may be a Government controlled waterway for coastwise shipping, reducing the voyage between Long Island Sound and Massachusetts Bay by several hours.

Third. Many vessels now go from New York to Boston because the canal is in operation. Were it not for the canal, the type of barges used would not be able to

go east of Long Island Sound. Were it not in operation, the flow of bulk merchandise between these ports would be reduced. There is a grave danger that it will be closed.

Fourth. With tonnage, both self-propelled and not, at a premium as at present, the saving in time, and consequently money, made possible by the canal connecting the two bodies of water, i. e., Buzzards Bay and Cape Cod Bay, is of the most paramount importance.

For the above cogent reasons we therefore ask that the Government purchase the Cape Cod Canal.

Respectfully submitted.

NEW YORK BOAT-OWNERS' ASSOCIATION (INC.).
ERNEST STAVEY, *Secretary*.

Tonnage passed through the Cape Cod Canal by James Hughes, jr., from May 1, 1916.

Date.	Boat.	Tons.	Loaded toll.	Light tons.	Light toll.
1916.					
May 4	R. M. Feeney	950	$47.50	950	$15.45
9	Katherine Horan	969	48.45	969	15.00
10	Duke	455	41.35	455	15.00
12	Helen Woods	1,000	50.00	.....	.....
12	Dorothy Price	852	41.60	.....	.....
20	Kath Horan	825	41.25	825	.....
23	Ida Woods	987	49.35	.....	.....
23	Mary Horan	968	48.40	.....	.....
26	Helen Woods	900	45.00	900	.....
27	Dorothy Price	798	40.00	798	.....
		8,704	452.90	.....	45.45
June 2	Mary Horan	955	47.75	955	.....
3	S. A. Johnson	700	40.00	700	.....
7	Kath Horan	1,019	50.95	.....	.....
7	R. M. Feeney	907	45.35	.....	.....
7	Persuance	630	31.50	630	39.42
8	Ida Woods	524	15.72	524	15.72
10	Perseverance	318	14.00	318	14.00
13	S. A. Johnson	412	15.00	412	.....
15	Kennelly Bros.	908	45.40	908	15.00
15	Junior	728	36.40	728	15.00
17	....do.....	450	15.00	450	15.00
24	Kennelly Bros.	489	15.00	489	15.00
25	Ida Woods	985	49.25	985	15.72
25	M. P. Horan	728	36.40	.....	.....
25	Helen Woods	1,027	51.35	.....	.....
25	Kath Horan	900	45.00	900	15.00
28	Mary Horan	959	47.95	959	.....
29	R. M. Feeney	910	45.50	910	15.45
		13,549	637.52	.....	175.31
July 9	Ida Woods	995	49.75	995	15.72
11	Junior	750	40.00	750	.....
15	Helen Woods	900	45.00	900	15.15
19	M. P. Horan	373	39.00	373	15.00
19	Mary Horan	958	47.90	958	15.00
27	Junior	450	40.00	450	15.00
31	Martin Horan	650	39.00	650	14.00
		5,036	300.65	.....	89.87
Aug. 3	Mary Horan	958	47.90	958	15.00
4	Kennelly Bros	858	42.90	858	15.00
6	C. Horan	965	.....	965	.....
6	Rose Feeney	1,002	.....	.....	.....
6	Ida Woods	967	146.70	967	45.60
13	John C. Fields	895	.....	.....	.....
13	Mary Kennelly	866	88.05	866	.....
15	Kathleen	900	.....	.....	.....
15	Helen Woods	984	94.20	984	.....
18	Kennelly Bros.	489	.40	489	15.00
19	Ida Woods	967	19.30	.....	.....
19	Rose Feeney	1,000	98.35	1,000	.....
22	C. Horan	900	.45	900	.....
27	Martin Horan	780	.39	780	.....
27	Helen Woods	930	.....	.....	.....
27	M. A. Kennelly	934	93.20	934	.....
28	Kathleen	884	44.20	884	56.22
		15,279	798.80	.....	146.82

Tonnage passed through the Cape Cod Canal by James Hughes, jr., from May 1, 1916— Continued.

Date.	Boat.	Tons.	Loaded toll.	Light tons.	Light toll.
1916.					
Sept. 2	M. P. Horan	350	$39.00	350	
4	Mary Horan	934	46.70	934	$15.00
10	J. C. Fields	899			
10	Ida Woods	915	90.70	915	
15	J. C. Fields	444			
15	Mary Horan	350	40.00	350	
19	Kennelly Bro	853			
19	M. A. Kennelly	922			
19	Helen Woods	1,008	139.15	1,008	
21	Ida Woods	524			
21	Kennelly Bros	489	30.39	489	
21	Kathleen	902			
21	C. Horan	945	92.35	945	
24	Kathleen	481	15.00	481	
26	M. P. Horan	675			
26	Rose M. Feeney	932	80.35	932	
26	J. C. Fields	903	45.15	903	
29	Helen Woods	1,000	50.00	1,000	
		13,526	668.79		15.00
Oct. 2	M. A. Kennelly	480	14.40	480	
3	M. P. Horan	373	14.00	373	
4	Catherine Horan	481	40.00	481	
	Ida Woods	1,014	50.70	1,014	
7	J. C. Fields	444	.40	444	
8	R. M. Feeney	800	.40	800	
9	Mary Horan	929	46.45	929	
13	Kathleen	878			
	Kennelly Bros	852	86.50	852	
21	Ida Woods	950	47.50	950	
	Kathleen	481	15.00	481	
22	M. A. Kennelly	868	43.40	868	
25	Mary Horan	480	40.00	480	
28	Kennelly Bros	530	40.00	530	
	M. P. Horan	699	39.00	699	
		10,259	556.9		
Nov. 4	Casco	41	12.50	41	
	Falmouth	37	12.00	37	
	J. C. Fields	826	41.30	826	
6	M. A. Kennelly	480	15.00	480	
	M. P. Horan	480	15.00	480	
12	Ida Woods	921			
	Helen Woods	1,010	96.55	1,010	
20	R. M. Feeney	1,021	51.05	1,021	
	J. C. Fields	840	42.00	840	
22	Ida Woods	524	15.72	524	
23	Helen Woods	505	15.15	505	
29	W. J. Townes	1,216	60.80	1,216	
		7,901	377.07		
1917.					
Mar. 1	Kathleen	481	15.00	481	
	Kennelly Bros	489	15.00	489	
	Kath Horan	928	46.40	928	
2	Ida Woods	1,075	53.75	1,075	
3	Nicolas M. Murphy	845	42.25	845	
	W. G. Towns	1,047	52.35	1,047	
	Washington	856	42.80	856	
	Col. J. F. Gaynor	153	18.00	153	
4	Kenneth W. McNeil	578	17.34	578	
6	E. Hughes	111	16.00	111	
8	Mary Horan	480	15.00	480	
	Kath Horan	481	15.00	481	
14	Rose M. Feeney	985	49.25	985	
	M. A. Kennelly	925	46.25	925	
12	N. Murphy	509	15.27	509	
15	J. C. Fields	848	42.40	848	
16	Williamsburgh	719	35.95	719	
17	Kennelly Bros	807	40.35	807	
	M. P. Horan	709	35.45	709	
20	Ida Woods	524	15.72	524	
	R. M. Feeney	515	15.45	515	
21	W. G. Townes	579	17.39	579	
	Washington	435	15.00	435	
22	M. A. Kennelly	480	15.00	480	
	J. C. Fields	442	15.00	442	

Tonnage passed through the Cape Cod Canal by James Hughes, jr., from May 1, 1916— Continued.

Date.	Boat.	Tons.	Loaded toll.	Light tons.	Light toll.
1917.					
Mar. 24	Williamsburgh	319	$14.00	319	.....
27	M. P. Horan	373	14.00	373	.....
	J. F. Gaynor	153	18.00	153	.....
	K. W. McNeil	1,103	55.15	1,103	.....
	N. Murphy	817	40.85	817	.....
31	Kennelly Bros	800	40.00	800	.....
		19,566	889.37	.....	.....
Feb. 24	Tug Juno	75	15.00	75	.....
Mar. 25	Scow A. S. R. Co. No. 1	[1] 200	132.50	.....	.....
Apr. 1	N. Murphy	503	15.09	503	.....
	Mary Horan	962	48.10	962	.....
	Kath Horan	937	46.85	937	.....
2	Juanita	111	16.00	111	.....
4	J. F. Gaynor	153	18.00	153	.....
	Jefferson	853	42.65	853	.....
	Ida Woods	1,001	50.05	1,001	.....
	Snob	846	42.30	846	.....
	R. M. Feeney	1,004	50.20	1,004	.....
5	Dunmore	581	17.43	581	.....
	W. G. Townes	1,217	60.85	1,217	.....
7	Mary Horan	480	15.00	480	.....
10	Washington	864	43.20	864	.....
	Lake Michigan	973	48.65	973	.....
11	K. W. McNeil	1,050	52.50	1,050	.....
13	Snob	441	15.00	441	.....
14	Ida Woods	524	15.72	524	.....
	R. M. Feeney	515	15.45	515	.....
16	W. G. Townes	579	17.37	579	.....
	Washington	435	15.00	435	.....
	M. A. Kennelly	903	45.15	903	.....
	Regina Scully	841	42.05	841	.....
	Peerless	102	16.90	102	.....
	Kath Horan	900	45.00	900	.....
	Jefferson	790	39.50	790	.....
	Lake Michigan	480	15.00	480	.....
19	N. Murphy	932	46.60	932	.....
20	M. A. Kennelly	480	15.00	480	.....
23	Williamsburgh	743	37.15	743	.....
	Kathleen	902	45.10	902	.....
24	Mary Horan	957	47.85	957	.....
25	R. M. Feeney	973	48.65	973	.....
	Ida Woods	991	49.55	991	.....
26	Adams	797	39.85	797	.....
	H. Woods	1,003	50.15	1,003	.....
	K. Brothers	905	40.25	905	.....
27	N. Murphy	503	15.09	503	.....
	R. Scully	470	15.00	470	.....
30	Snob	.....	.....	.....	.....
	Lake Michigan	1,821	91.05	1,821	.....
	Kathleen	481	15.00	481	.....
	Mary Horan	480	15.00	480	.....
	R. M. Feeney	515	15.45	515	.....
		31,008	439.35	.....	.....
	Total	124,903	6,229.40	.....	$352.61

[1] Feet.

Senator WEEKS. I would like to have the committee hear next from former Congressman McNary, who is a member of the Waterways and Land Commission of the State of Massachusetts.

STATEMENT OF HON. WILLIAM S. M'NARY.

Mr. MCNARY. I am a member of the waterways and land commission and also a director and a member of the executive committee of the Deeper Waterways Association.

Of course this subject has been quite largely covered now. For the last five years I have served on the board of harbor and land commissioners and the waterways

commission, which has had charge of the supervision of the building of the canal, and for that reason am quite familiar with that feature of the matter, and also I am quite familiar with what has happened since the canal was opened up. The benefits have been manifest, distinctly, and definitely.

The business of the canal has steadily increased, and this canal is not a sort of a moribund canal, as the Chesapeake & Delaware Canal is. Although the Chesapeake & Delaware Canal has a certain amount of business, it is restricted because it is only about 24 feet wide in the locks. The Cape Cod Canal has had a steadily increasing business and bids fair to become, even without the Government touching it, and without further widening and deepening, an extremely important waterway and of great benefit to the port of Boston and to the ports beyond Boston; but with the Government taking it over and the improving and widening of that canal it will prove of inestimable value to the country.

The committee should understand that the waterway around through Vineyard Sound is one of the great waterways of the world. It compares with the Suez Canal, which is to the minds of most of us the biggest waterway in the world. Of course the tonnage of Sault Ste. Marie Canal is larger than that of the Suez Canal. The tonnage passing around there is as great as that going through the Suez Canal. About one-fifth of that tonnage is now going through the Cape Cod Canal and not around over the shoals and around the cape. The advantage has been so great that schooners which formerly went over the shoals and through the Vineyard and by the shoals, and in foggy, thick weather had to anchor behind Monomoy, which it was supposed would never use the canal, are using it at the present time.

Many things have been said here, and questions have been asked particularly as to whether or not the taking over of this canal by the Government, and perhaps the widening and deepening, would decrease freight rates. I certainly think it would. That has been the experience wherever canals have been taken and operated under Government ownership. The Soo Canal is an example of that, as is also the Welland Canal. One of the most impressive statements I ever heard in my life as to waterways was made by Senator Ransdell at the dinner of the Chamber of Commerce at Boston, where he pointed out that the great transportation from Lake Superior was brought down through our waterways from the Great Lakes at a rate of freight which was the cheapest in the world on that heavy and bulky freight.

This canal is a success as it stands. I do not know whether it has paid any dividends; I do not know whether it has got to the point where it is earning dividends; but I have no doubt it will pay dividends or can be made to pay dividends in private ownership. But many of us have felt from the beginning that the canal should not have been in private ownership or have been left in private hands, and there has always been an opinion in the State of Massachusetts that the canal should have been built by the United States Government. Numerous attempts have been made in regard to building the canal at this place, and the first idea of the canal was conceived back before the year 1700. Col. Jervey says:

"The Cape Cod Canal, our first completed transversal ship canal, was first suggested when the General Court of Massachusetts, in 1697, appointed a commission to survey a route across the neck; it was opened to traffic 217 years later, in 1914."

That traffic was with an 18-foot depth. I might say in passing that now we have a 25-foot depth.

Col Jervey says:

"It is a sea-level canal, at present 25 feet deep, 100 feet wide at the bottom, and 220 feet at the water surface, with two passing places."

That 220 feet and the two passing places is not entirely correct.

"The approaches are wider. The length from bay to bay is 7½ miles; including the dredged approaches, the length is 13 miles. The saving in distance between New York and Boston for vessels using the canal is 62 miles."

These quotations I have taken from an address by Lieut. Col. Henry Jervey, Corps of Engineers, United States Army, before the thirteenth annual convention of the National Rivers and Harbors Congress, held in Washington, D. C., December 6, 1916.

The CHAIRMAN. Do you mean to say that there has not been a canal there previous to this?

Mr. MCNARY. No; there never was a canal there. There was a carry there. There have been times when the water approached on both sides there, and it was an old Indian carry. The first authority that ever gave a first-class impetus to the building of the Cape Cod Canal was Gen. George Washington when in command of the troops at the siege of Boston. At that time he sent down there one of his best engineer officers, who made a report advocating the building of that canal for the purpose of supplying the troops. There never was a canal there until this present canal was built, but there have been numerous attempts of people who have asked for charters from the

State of Massachusetts for building a canal there, and those charters were almost invariably, for one reason or another, on account of the large amount of money, or for whatever cause, made unworkable when they were given.

The CHAIRMAN. I had an impression that this was a new enterprise.

Mr. MCNARY. Indeed, it is; but the project is not new. I am merely indicating how far back people realized the importance of this thing.

The reason why the charters were always made unworkable may be fairly stated by saying that the railroads did not particularly like to see canals at that time, and the influence of the railroads was always against it in Massachusetts. The people of Cape Cod themselves did not want it in the beginning. Cape Cod has ceased from being a seafaring place, and it is now a cranberry-raising and summer-camp place; but the people and merchants of Boston and of New York and the people that tow coal around the cape with such great danger—and there is no more dangerous place in the whole world than Cape Cod; the statistics of disaster there show that Cape Cod is as dangerous a place as any place in the whole civilized world; Hatteras I do not think compares with it in danger—those people wanted it.

That has been of great importance to Boston. There has not been any remarkable decrease in the freight rates yet, but there has been a security in the passing of the vessels and cargoes, and we have not the slightest doubt, viewing it from the standpoint of people of experience, that decrease in freight rates will inevitably follow.

Secretary Redfield pointed out the commercial advantages of the canal here quite clearly.

Admiral Benson pointed out the military advantages of the canal.

I have here a document which I think ought to be filed with this committee by somebody. It is an address entitled "The Military Value of Internal Waterways," by Lieut. Col. Henry Jervey, Corps of Engineers, United States Army, acting director, Army War College, delivered before the Thirteenth Annual Convention of the National Rivers and Harbors Congress, Washington, D. C., December 6, 1916. In this address he takes up this question of the military and naval value of canals, and goes into the various canals of the world and shows the tremendous advantage to the United States Government, particularly of the longitudinal canals along the coast, and of that canal which has been recommended along the Atlantic seaboard. They have advocated it on the ground of its commercial value. He considers it on the ground of its military value, and compares it with other canals, and takes up for consideration the Kiel Canal and the Panama Canal and the Suez Canal and the various canals in Germany, and shows the great advantage that it has been to Germany to have her canals for purposes of preparation for offense and defense. The cost of this canal has been entered into; $12,000,000 can be stated as approximately the cost. That is the amount that the people of Massachusetts said shall be given to the people for building that canal; and the cost of the widening and deepening of the canal is something to be found out under this bill, which, I take it, is a preliminary bill.

Senator WEEKS. Mr. Chairman, if the committee is willing, I will take that pamphlet and indicate to the stenographer the parts that are pertinent to this hearing and print them in the hearing.

Mr. MCNARY. I have marked a few of them, and others might well be marked.

Senator RANSDELL. I was going to suggest that perhaps the whole thing should go in. The Rivers and Harbors Congress thought it valuable enough to have it printed as a separate document. It is not very long.

Mr. MCNARY. Yes; it is printed in separate form.

Senator RANSDELL. It is printed as a separate document by the Rivers and Harbors Congress. Is there any objection to letting the whole pamphlet go into the record of this hearing?

The CHAIRMAN. I do not know.

Senator WEEKS. I will look it over, and if there is any part that might be left out I will mark it to be left out, but otherwise it will be put in the hearing, if there is no objection.

The CHAIRMAN. Do you know anything about the cost of the maintenance of this canal now?

Mr. MCNARY. The maintenance cost, I think, would be better stated by others. You see, our board does not enter into that question at all. Two or three of the canal officials are here. We were not empowered to enter into the cost of maintenance of the canal or the cost for tolls. We were empowered to supervise the building of the canal and to see that the building conformed under the specifications or the plan adopted, and we were authorized to release stock and bonds to them as they went along, according to the certain percentage of work done, and that has been our business. The canal is completed as regards its depth and its width. There are only a few minor things, such as a temporary ferry, remaining; whether that is to be taken and a permanent ferry put in, and with regard to the connection with a street railway. Those are practically matters of no importance to the canal.

Studying the history of other canals, I think this canal ought to be in the hands of the Government, and I think that the canal to be of its ultimate complete benefit to the country ought to be widened and deepened. Col. Jervey thinks it ought to be 40 feet deep. Thirty-five feet at this time would seem, to my judgment, to be sufficient unless Col. Jervy has some additional information in regard to increase of depth of draft of battleships; 35 feet would carry anything at this time, and 50 feet would probably carry any of the known commercial vessels of the world, although in Boston we have deepened the channel to 35 feet and to 40 feet, and if we are going to have a depth of 50 feet, an absolute seagoing canal, capable of taking the largest vessels, I will remark that it ought to be 40 feet, and along around the coast 35 feet, and practically 30 feet was the limit of the coastal freight. Now, you have more of the big colliers of the Consolidated Gas Co., drawing from 28 to 30 feet, and those at the present time go outside of the cape because the canal is not big enough to accommodate them. I doubt whether they have ever gone through the canal with a draft of 28 feet; but substantially all of that commerce is accommodated by the present canal, and there is a constant tendency to increase the draft of both freight vessels and passenger vessels, and that would answer the question whether there would be a decrease of freight rates, because as the economy of transportation develops on the waterways there has always been a decrease in freight rates, as history shows. I think this is of immense advantage commercially to New England and the northern ports and of immense advantage to us and to New York and the ports of the South. We should expect a decrease in freight rates on coal and cotton and lumber as the result of the deepening and widening of this canal and the taking of it over by the Government.

Now, we are not here to urge any particular price; we are not here to set any such figures as that; but we are here to simply say that in our judgment it would be a benefit to the whole country and to the commerce of this country, and the military and naval benefits could be better testified to by the military and naval officers, of having this canal taken over by the Government and deepened and widened. We are convinced from our observations of private individuals that they have expended up to their limit on the construction and equipment of the canal, and that they will not deepen it or widen it; that they can probably make it pay at the present basis, and there is no particular inducement for them to make it deeper or wider.

I agree with one of the gentlemen here in that I think the canal could be deepened and widened without interrupting the traffic through the canal. Several vessels have sunk in the canal and have interrupted the traffic somewhat, and yet with one large vessel sunk in the canal Mr. Austin's traffic between New York and Boston was carried on, passing just a few feet clear of the obstruction in the canal, and keeping on, and dredging operations have gone on in the canal while it was being used, because there has been very little shoals formed there. One boat was struck by one of the dredges and sunk. Nevertheless, it has been possible to use it, and it has been used. If the canal is to be deepened and widened by the Government there are no material obstacles to deepening or widening. The canal is largely through sand and bowlders. There is one place where they encountered a nest of bowlders. Of course the removing of the bowlders has been a slower operation than one of dredging sand. and that would retard them somewhat. That is more or less a matter of time. There is no great difficulty about it and no tremendous expense.

Now, I think the points have been sufficiently covered, and I have not anything particular further to say except this, that as a member of the Deeper Waterways Association and as one of its officials, I will say that this is one of the things that they would naturally agree to and naturally advocate in addition to advocating the taking over of the Chesapeake & Delaware Canal by the Government and widening that and deepening and widening the channel in New York Bay and to Philadelphia and the Delaware River, as is advocated by Col. Jervey, and the building of a commercial and military canal down into the North Carolina Sounds, and so on into the South.

Senator RANSDELL. What facts, physical or otherwise, would determine whether or not a given vessel, leaving Boston or New York or some other point, should pass through the canal or should take the other course?

Mr. MCNARY. One fact is time. There is a saving of somewhere from four to six hours in time with a steam vessel. That is one fact.

Another fact, of course, is depth; a vessel drawing a large amount of water. For instance, one of our dreadnaughts would not take the Vineyard Sound and the shoals outside because of the lack of depth of water there. Under great stress, under conditions where she would be compelled to make that passage, she would be compelled to go below Nantucket and below the lightship. Another fact, of course, is the weather. In foggy weather—very foggy and bad weather—no vessel under a safe master would think of passing over the shoals and around Cape Cod unless absolutely compelled to do it; and many vessels have laid for days and weeks at a time in that place behind Monomoy until the fog cleared away.

Senator RANSDELL. They could have used the canal with advantage?

Mr. MCNARY. Yes; they could have used the canal with advantage, because in Buzzards Bay there is comparatively safe water up to the mouth of the canal.

Senator RANSDELL. When a vessel starts out from port it does not know, necessarily, whether it is going through the canal or not?

Mr. MCNARY. Not necessarily.

Senator RANSDELL. A change in the weather conditions may determine it to go through the canal?

Mr. MCNARY. Yes, sir. There are certain lines of vessels now that of course would take the canal as a regular proposition, and some of these coal carriers now have adopted the canal as a regular proposition. They take their tows through the canal, and they would not pass outside of Cape Cod under present conditions. But there are other vessels who, if they thought it was going to be bad or foggy weather outside and over the shoals and outside the Cape, would take the canal for safety; and that will increase in the future.

The CHAIRMAN. What expense would this deepening of the canal from 25 to 35 feet have on the question of whether you would have to put in a lock or not? Would that have any effect?

Mr. MCNARY. In my judgment, no effect. I never thought a lock was necessary after studying the current in that canal. Many engineers admit that it would be preferable to operate the canal without a lock, and I do not think this widening and deepening would necessitate a lock to have to be put in there. The current itself is not an obstacle to be dreaded if you have room to handle a vessel in, and if you have a sufficient depth of water so that her propeller and steering apparatus can give her leverage on the water, a tremendous current is then not of any consequence.

Senator RANSDELL. Which way does the current run?

Mr. MCNARY. Both ways.

Senator RANSDELL. First one way and then the other?

Mr. MCNARY. Yes; there is a curious condition there. There is a rise of 7 feet on Cape Cod Bay and of only about 5 feet on the Buzzards Bay side; that is, the mean tide. On the other end there is an extreme rise, under certain conditions, of 13 feet on the Cape Cod side; so that there is always a current one way or the other in that canal.

Senator RANSDELL. The two tides do not rise at the same time?

Mr. MCNARY. They do not, exactly; so that there is always a current. There may be some time in which there is equilibrium between the tides; but practically there is always a current which flows to the east and then to the west, and so on. But that has been safely navigated and by hundreds of boats, either with or against the current. Now, there may be an impression produced in your minds, because it is a one way current, that it can only be operated with or against the current. It is only a one-way canal in the sense that it is safer to operate it one way.

Senator RANSDELL. And boats can not pass one another in the canal?

Mr. MCNARY. They can not. At the entrances they can, but in the main body of the canal they can not.

Senator RANSDELL. It would cost very little, if the Government took it over, to make places where they could pass?

Mr. MCNARY. Yes. That was the original design of the canal. There were three passing places laid out in the canal. One was taken to put the Saginaw Street Railway tracks across, and that eliminated one of them, and then the engineers adopted the idea of widening the entrances, and then making a one-way canal rather than a two-way canal, with places at the ends where boats might lie while others passed.

The CHAIRMAN. They have a jetty on the east end?

Mr. MCNARY. They have a jetty on the east end. The other end is protected and there is no jetty there.

If the Government took it over some dredging would be needed there to make a place where boats might lie, and it might be necessary to extend the jetty on the east end. I see no material difference as regard the question of locks. We went into the question of a lock very, very thoroughly, indeed, and while we had the advice of some engineers that a lock might be desirable, it has not been found necessary in practice, and that is the best test.

Senator WEEKS. I have but one more witness, and I would like to have him finish to-night, Commodore Miller, the vice president and general manager of the canal.

STATEMENT OF MR. J. W. MILLER, LATE LIEUTENANT COMMANDER, UNITED STATES NAVY.

Mr. MILLER. Mr. Chairman and Gentlemen, I was reluctant to appear before the committee as vice president of the canal, thinking that you, naturally, might associate me with interest in the corporation of which I am now an officer, and conclude, therefore, that I could not perhaps make my statements entirely impartial.

It may be well for me to state that several years before I became connected with the company I made a report to the president of the Long Island Sound Lines regarding the value of the canal to commerce, and to a prominent naval officer on the advantage it would be to the Navy. The views I then expressed still hold, and have been amplified by the previous witnesses; yet it may not be amiss to restate a few of them in brief.

As early as 1627 the Pilgrims, under Miles Standish, were trading with the Dutch from New Amsterdam through the narrow isthmus where the canal now exists. It was called a passage from the "South Sea to the North," and small boats from the east approached those from the west within 3 miles. From that date to the Revolutionary War the canal was talked of. Gen. Washington advocated it in 1776 in order to "give greater security to navigation and against the enemy." Just after the Revolutionary War, officers of high military authority urged its construction, including Gallatin, Secretary of Treasury, who, in 1808, speaks of it as "useful in time of war." It was a necessity at the time of the War of 1812. During the whole of the last century various governmental, State, and other interests endeavored to further the cause, numerous surveys being made by Army and Naval officers, and corporations formed.

I submit the following chronology:

CHRONOLOGY.

1524. May, Cape Cod sighted by Verrazzano from deck of the *Dauphine* and named Pallavicino.
1602. June, Bartholomew Gosnold landed on the cape from the *Concord* and started settlement of Elizabeth Islands.
1605. De Monts, a Frenchman, cruised around cape; called it "Malebarre."
1620. Arrival of Pilgrims.
1623. Miles Standish inspecting coast south of Plymouth.
1627. Standish trading at Manomet with Dutch from New Amsterdam. Boats within 3 miles of each other. Small canal talked of.
1676. Samuel Sewell examined canal route for "a passage from the South Sea to the North."
1697. General Court of Massachusetts appoints a committee to view the place for a passage from Barnstable Bay to Manomet Bay.
1717. Capt. Cyprian Southack describes a free water connection across the Cape Colony of Massachusetts and many individual examinations for shallow canal until
1776. Gen. Washington ordered Thomas Machin to survey the route which would "give greater security to navigation and against the enemy." Also James Bowdoin and William Sever appointed a committee to investigate subject.
1780. Gen. Henry Knox using influence to have Government build canal.
1791. John Hills and James Winthrop make survey.
1798. James Sullivan and others petition legislature to build.
1803. Committee appointed by legislature to interest people in project.
1808. Gallatin, Secretary of Treasury, advocated it as "useful in time of war."
1812. Isthmus used by small boats to avoid capture by enemy.
1818. Israel Thorndike and Thomas H. Perkins employed Loammi Baldwin to survey route. 5,000 ships rounding cape. United States Senate made survey for a canal sufficient to admit vessels of war.
1824. United States, under resolution of Senator Lloyd, ordered Maj. Perault to make survey. Various Army officers reported route practicable.
1825. Further surveys made under Government orders until 1827.
1828. Government board reports on canal 36 feet wide, 8 feet deep, to cost $669,522.
1844. Lieut. G. S. Blake, United States Navy survey.
1860. Renewed interest by Massachusetts and Government. Surveys by Brig. Gen. J. G. Totten, Prof. A. D. Bache, superintendent Coast and Geodetic Survey; Commander C. H. Davis, United States Navy, and Lieut. J. Wilkinson, United States Navy. Report on 18-foot canal to cost $10,000,000.
1870. Charter to Cape Cod Ship Canal Co., to Alpheus A. Hardy, and others. Maj. Gen. J. G. Foster, United States Army, examining route under orders. Reports on practicability of 23-foot canal without locks.
1870. Senator Chandler introduces bill in Congress to pay for breakwater.
1880. Charter granted to Cape Cod Canal Co. Henry M. Whitney and others interested. Some work done, but project abandoned.
1882. Gen. G. K. Warren, United States Army Engineers, reports to Government on canal and cost of approaches.
1883. Cape Cod Ship Canal Co. authorized. William Seward, Samuel Fessenden, and others interested. Funds advanced by Quincy A. Shaw. Company made contract with F. A. Lockwood. Excavated over 1,000,000 yards and failed. C. M. Thompson engineer.

1890. Property assigned to Col. Thomas L. Livermore by F. A. Lockwood.
1891. Charter granted to E. L. Corthell and others in the name of Massachusetts Maritime Canal Co. This charter lapsed.
1898. De Witt C. Flanagan, of New York, became interested.
1899. June 1, charter to the Boston, Cape Cod & New York Canal Co., under which, and its amendments, present company acting. During the three successive years Mr. Flanagan, Gen. C. C. Dodge, and associates advocating canal. Reports from the engineers, A. L. Rives and E. L. Corthell.
1904. Mr. August Belmont and others became interested.
1906. Voluminous report, under instructions from William Barclay Parsons, C. E., from C. S. Sims to F. D. Underwood.
1907. May 8, approval by joint Board of Railroad and Harbor and Land Commissioners of the present location of canal.

In addition to this brief historical sketch, I might add that the original report referred to by me gave the statistics of tonnage rounding the cape, and also the dangers and loss of time and life through the outside route These figures have been substantiated by further investigation, and most of them have been given by former witnesses to-day. Supplementing those figures and as further testimony, I would state that in addition to the canal proper granted to the company by its charter, it was essential to dredge an extra 4½ miles to reach a depth of 25 feet at low water in Buzzards Bay. This channel is in Government waters, and, through its deepening, both the Government and the State of Massachusetts have received a great improvement to their waterways without any expense to them. Further, a breakwater 3,000 feet long has been built in Cape Cod Bay without cost to the Government, thereby affording a harbor of refuge to the large fishing fleet operating in the neighborhood. This breakwater and the making of the fine channel in Buzzards Bay I estimate, without having the figures before me, cost the canal company something like $3,000,000. On other portions of the coast the Government has provided such facilities, notably at Point Judith in Rhode Island, with less benefit to commerce than that provided by the improvements in Buzzards Bay and the breakwater in Cape Cod Bay.

It is to be noted especially that Buzzards Bay has not been developed at all, either by the State or the United States, from a commercial point of view. The possibilities there in that direction are even better than those of Narragansett Bay, more particularly since the canal has made a channel up to the main New England railroad. The point is this, in addition to the canal, vessels—even from Panama Canal and all points north thereof—can, in the future, unload crude material for the Eastern States, and load manufactured goods on the return trip, from wharves of the New Haven Road, through the fact that a private corporation has dredged a channel in Government waters to accomplish that desirable object.

The former witnesses have covered pretty much the comparative advantages of the inside route against the outside one. I would emphasize, however, some figures I made several years ago that the average loss of time for barges through the Vineyard Sound route was at least three days, and it is especially to be remembered that Buzzards Bay is a smooth sheet of water, with over 50 per cent less fog and no shoals or shifting sand.

The subject of passing places has been spoken of. Originally we had a passing place in the middle of the 8-mile canal where the 100-foot bottom width exists. An exhaustive study showed that this passing place would delay vessels more than if we began at each end and widened the channel. Therefore, we did the latter, making the approaches at each end from 200 to 300 feet wide, thus shortening the 100-foot stretch and giving more mobility to the canal, besides improving it for future enlargement. This also gives us an anchorage harbor at the eastern end.

The desirability of locks has been touched upon. A lock would only mean delays, and quick passage on this short cut is most essential. Further, a lock would cost more than deepening and widening if it were one of sufficient length to accommodate barges. The current through the canal does not average more than that through Vineyard Sound. Superficially it gives the idea of much greater strength on account of the narrow channel. I would like to correct the statement regarding its velocity. We had a 4-knot current there on extreme spring tides, which lasted about 20 minutes, but ordinarily the maximum tidal flow is less than 3 miles an hour, and then only runs for a very short time. The average is about 2 knots an hour. This flow has its advantages, as it quickens the passage of well-found ships, as stated by several previous witnesses.

Reference has been made to Pollock Rip Channel and its dangerous sharp angles. It can never be permanently dredged, and is entirely useless for shipping in case the Government deepens the canal. The cost of dredging it would be about $5,000,000, and it will silt up very quickly. As stated before, it can never be permanent. Here

is an expense the Government can be saved, namely, if it puts that $5,000,000 into the canal. It is well to think of this in connection with the improvements made in Government waters.

The CHAIRMAN. Do you know the depth of Pollock Rip Channel?

Mr. MILLER. It varies from 17 to 21 feet, according to how much sand drifts in.

Senator WEEKS. That is, at low water?

Mr. MILLER. Such is my recollection. I have not looked at the figures lately. There is a difference in tide off Cape Cod of approximately 8 to 10 feet. It should be remembered also that there is another channel to the southward of Pollock Rip which vessels can use, although the distance through the latter is 17 miles longer to Boston.

Senator WEEKS. Do you think that even $5,000,000 spent there would make a permanent channel?

Mr. MILLER. Absolutely not. I do not think it would last for a year.

A question was brought up by Mr. Calder and others, which is germane to this subject, and that is the deepening of the East River. As an ex-naval officer, who has given the East River subject much study, I should say it is almost a military crime that the greatest port of the United States, which has the unique advantage of a double exit and entrance—the Government—should not have deepened the East River Channel long ago, especially as the largest navy yard in the country lies between Sandy Hook and Long Island Sound, and there is no way of getting the larger battleships through Hell Gate and thence into the protected inland Long Island Sound. Once the various shoals from the navy yard are deepened to 40 feet, we have a marine trench between Boston and New York if the canal were deepened, in which, in addition, can be placed all the auxiliary vessels ready to shift to the three strategic points explained by Admiral Benson. Such a marine trench would mean a saving of 140 miles to the larger battleships, and all the naval fleet, large and small, would be ready for any point east or west, and out of sight of the enemy. This would relieve at least one battleship for coast protection and duty on the first line of defense at sea. The cost of that battleship would be practically $15,000,000. Again I draw to your attention the fact that the deepening of the canal (leaving aside the question of the movement of smaller ships) would be a great economy from a military point of view, to say nothing of the protection afforded to the merchant marine in time of peace.

Senator WEEKS. You will recall that the submarine base which has recently been established by the Navy Department is at New London, which is in the same territory.

Mr. MILLER. Yes. I think that my designation of the adjacent waters as a marine trench is a true one from a military point of view.

Another reason why I was reluctant to appear here was because I thought the committee might think that my testimony was biased, as I had been manager of the canal for the last few years. It has somehow got abroad, Mr. Chairman, that we are here advocating the Government's taking it over. My understanding is that the president, directors, and stockholders of that canal are satisfied with its increasing earning power. Considering the troubles incident to a new concern, which, in a waterway, are much more numerous than on land lines, the canal has done well. The current was naturally greater at first on account of the time required to create a uniform bottom. Now that the channel has been evenly dredged, we find that the difficulty of shifting sands is much less than was expected. In the desire to accommodate all sorts of ships during the early days of the canal, I especially stretched a point to take certain ones through which should not perhaps have been allowed. They were a type of vessel which either the owners or the Government did not permit to have a deep-sea license. Consequently we had some accidents. Such craft we do not take now, and during the last year all physical and other conditions have been bettered. We have now carried nearly 6,000,000 tons through the canal in 20,000 vessels. One hundred and ninety-four vessels have been governmental.

The CHAIRMAN. In about how many months?

Mr. MILLER. Since the opening of the canal, including the time when we were not in complete working order or had not our full depth of 25 feet at low water.

The CHAIRMAN. On what date did you open it for traffic?

Mr. MILLER. July 30, 1914; but that was only for small vessels.

Senator WEEKS. What do you estimate the earnings for this year?

Mr. MILLER. At the rate of from $1,000 to $1,500 per day.

Senator WEEKS. How much was the canal earning a year ago?

Mr. MILLER. I can give you those figures, but I have not got them here. It was earning a little over half of that.

The CHAIRMAN. Have you increased your rates?

Mr. MILLER. No, sir; the rates have not been increased. They vary according to the classes of freight or vessel; and I will leave a copy of the tolls with you if you so desire.

The CHAIRMAN. I understood from the manager of the steamship company this morning that at one time he paid something like $150 or $200 for a ship that he now pays $410 for.

Mr. MILLER. That was on a basis of their making a yearly contract with us, which they are not ready to do now. In order to encourage business we gave them a test rate to see whether or not they would continue, and gave them their own price at that time last year. I can give you in detail the kind of business we are doing. Here is one day, amounting to about $1,600. If you wish, I can send you full details for a month.

Senator WEEKS. Do you think it is essential to put those in the record?

Mr. MILLER. Just as you gentlemen think best. For instance, here is another day when 12,217 tons went through the canal, of which 4,000 tons was cargo; and the returns were $1,105. That is about the average last spring, and when yachting begins it ought to increase. Again, it is to be noted that originally we had few, if any, schooners. We are getting more all the time. The amount of business that went around the cape, referred to by other witnesses and checked by me, was, in 1912, 20,275,262 tons. This did not include schooners or foreign vessels.

Senator WEEKS. That was the amount of business going around the cape?

Mr. MILLER. Yes. For instance, it included stone, lumber, brick, cement, sand, ice, oil, copper, and other commodities.

Senator WEEKS. Will you put those figures in the record, Mr. Chairman?

The CHAIRMAN. Very well.

Mr. MILLER. That is not the total. There was a large amount of other material from Nova Scotia and elsewhere which was not in the United States records.

The CHAIRMAN. That was the tonnage that passed around the cape through Vineyard Sound?

Mr. MILLER. Yes; it is simply the coast-line business.

(The tables submitted by Mr. Miller are here inserted in the record, as follows:)

Commodity.	Crude material rounding Cape Cod, year 1912.	Crude material through canal, year 1916.
	Tons.	*Tons.*
Coal	11,523,524	
Lumber	900,000	
Stone	300,000	
Cement	31,000	
Brick	50,000	
Lime	110,000	
Plaster	363,000	
Clay	50,000	
Sand	80,000	
Ice	280,000	
Oil	246,000	
Copper	55,000	
Fertilizer	100,000	
Salt	75,000	
Potatoes	25,000	
Paper pulp	150,000	
L. V. R. R. miscellaneous	228,000	
Total	14,566,524	1,228,843
Gross tonnage of ships of regular lines carrying passengers and freight	5,623,738	2,095,671
Gross tonnage of crude material, vessels light or without cargo		570,562
Yachts and pleasure boats	85,000	85,796
Government vessels		65,146
Grand total	20,275,262	4,046,018

NOTE.—A copy of this was submitted also by Mr. Jesse Baxter.

Statement of number of vessels and tonnage from Aug. 1, 1914, to Apr. 30, 1917, which have passed through Cape Cod Canal.

	Number.	Tonnage.	Crude material cargo on board.
			Tons.
Government vessels	194	123,682	
Yachts and commercial vessels	8,550	4,427,847	1,839,622
Canal company vessels (estimated)	10,833	945,577	
Total	19,577	5,497,106	1,839,622

Mr. MILLER. The question has been asked how we determine what coasters would go through the canal instead of through Vineyard Sound. The answer is that the vast majority of vessels from South Carolina follow the coast line when coming north, in order to keep in touch with the lights, and whichever route they have to take they all come to that point where your finger is on the map and then decide which way to go. In other words, after reaching a point to the southward of Buzzards Bay they can take either course—up that bay or through Vineyard Sound—as circumstances may dictate.

There is another important factor regarding the use of the canal which has not been brought out, namely, the State of New York is finishing its barge canal. Its tonnage is estimated at 5,000,000 per annum. Most of it is carried in barges. Their cargoes originate as far west as Duluth. They can proceed from the Great Lakes to Boston without breaking cargo through the canal.

The CHAIRMAN. They have to go outside here [indicating on map]?

Mr. MILLER. The spot you indicate is off Point Judith. It they find the prospect of bad weather there, when bound to the eastward, they can run in behind Fishers Island in Long Island Sound, or into Narragansett Bay. Of course, they will find smooth water in Buzzards Bay.

The CHAIRMAN. Are vessels detained going through the canal to any extent?

Mr. MILLER. If they happen to reach there, especially the large barge tows, during the strong head tide, we generally hold them an hour or two until the tide slacks, or if other vessels are coming in the opposite direction. We have an anchorage ground, piers, and wharves, particularly at the eastern end where the bottom is 300 feet wide, and we tie vessels up while they wait, if necessary. I would again emphasize the fact that the single track is only a little over 6 miles long.

The CHAIRMAN. It would take about an hour to go through?

Mr. MILLER. Yes; somewhat longer against the tide, but the large steamers make the passage in about 40 minutes.

Senator RANSDELL. Have you ever made any estimate as to what it would cost to enlarge that canal to a depth of 30 feet, so that boats might pass at two or three passing places?

Mr. MILLER. Never any accurate estimate. We have been waiting to see what might happen and how much the cost of dredging would increase over normal times. A rough guess would be about $5,000,000, or one-third the cost of a battleship.

The CHAIRMAN. Five hundred feet width?

Mr. MILLER. No; 300 feet bottom width. Personally, I think 200 feet bottom width would be sufficient through the 6 miles.

The CHAIRMAN. Some gentleman testified that for coal barges it ought to be 500 feet in width.

Mr. MILLER. I think 200 feet would be sufficient. Very few coal barges draw even 25 feet loaded, and with a 30-foot depth at low water there would be room to pass, especially as vessels of that draft could go over the lower part of the slopes of the banks.

The CHAIRMAN. What gives you trouble about maintenance? You must have a pretty good expense for maintenance, or otherwise you would be declaring dividends?

Mr. MILLER. We ought to be in a position to declare dividends this coming year. One of our great expenses has been towing. At present we are making ships do their own towing. Our operating expenses ought not to be over $200,000. We are earning now, as I mentioned before, at the rate of about $550,000, and the interest on the bonds is about $300,000.

The CHAIRMAN. Does the canal shoal or fill up?

Mr. MILLER. No more than we expected; in fact, not quite so much. The shoaling will lessen, as the canal is gradually getting to a more normal condition.

The CHAIRMAN. How about the banks? Do they cave in?

Mr. MILLER. They are harder and more stable than we expected, there being more bowlders and clay than we estimated for. The region is a glacial one, and sea sand was washed over the deposits brought down from the Arctic country.

The CHAIRMAN. What do you include in the fixed charges?

Mr. MILLER. The interest on the bonds, which is 5 per cent on $6,000,000, as well as the operating expenses. This would bring us to the figures mentioned before, namely, about $500,000. The prospects of the canal, therefore, are bright, and, as far as I know, satisfactory to the corporation. As a detail, I repeat that in the figures I made several years ago I estimated $25,000 per annum from yachts and Government vessels. We nearly doubled that last year, and the schooner traffic is larger than ever.

The CHAIRMAN. Do these schooners have to be towed?

Mr. MILLER. Yes; but yet they are coming to us, and paying, in addition, for the towing.

The CHAIRMAN. Does the rate on the schooners differ from the other rates?

Mr. MILLER. The tolls are the same as for other crude-material carriers.

The CHAIRMAN. Senator Weeks, are there any other questions?

Senator WEEKS. No.

Mr. MILLER. In giving you the fixed charges I think I overestimated the operating expenses, as they will probably be less this year. I think we can operate on the canal for about $180,000, and if the earnings are $550,000, we ought to be able to pay a small dividend.

Senator WEEKS. That is about what you said.

Senator RANSDELL. As I understand, your company is not seeking to sell at all?

Mr. MILLER. As I stated before, we are very well satisfied with the present outlook.

Senator RANSDELL. You are very well satisfied to retain your investment?

Mr. MILLER. We look forward with a great deal of encouragement to the future, considering the difficulties we have overcome and the excellent showing at present.

The CHAIRMAN. Do you mind stating what your tolls are?

Mr. MILLER. The tolls are a series of all different classes. The classes vary.

The CHAIRMAN. What causes them to vary?

Mr. MILLER. The type of ship. For instance, we made the crude-material rate originally at 5 cents a ton for loaded cargo and 3 cents for the return trip light. Mr. McNary, I think, stated that. Of course, vessels like yachts can pay more. Their rates run up to 10 cents and over. I have got a list of the various rates here.

The CHAIRMAN. I do not care to go into that.

Mr. MILLER. I will leave these schedules with you.

(The schedules of rates referred to by Mr. Miller are as follows:)

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

[Superseding all previous notices relative to toll rates for vessels of Class A.]

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

Tolls for yachts, motor boats, and vessels not engaged in commercial trade.

	Per single passage.[1]	Making a single passage through canal in squadrons of 10 or more vessels, per single passage.[2]	Making a round trip through canal, returning within 10 days, per round trip.[3]
For vessels less than 16 gross tons, based on length over all:			
Minimum, less than 30 feet	$5	$4	$8
30 to 34 feet	6	5	10
35 to 39 feet	8	6	12
40 to 44 feet	10	7	14
45 to 49 feet	12	8	16
50 to 54 feet	14	9	18
55 to 59 feet	16	10	20
60 to 64 feet	18	12	24
65 feet and over and less than 16 gross tons	20	14	28
For vessels over 16 gross tons:			
16 to 19	21	16	32
20 to 24	23	18	36
25 to 29	25	20	40
30 to 34	27	22	44
35 to 39	29	24	48
40 to 44	31	26	52
45 to 49	33	28	56
For vessels over 16 gross tons—Continued.			
50 to 74	$35	$30	$60
75 to 99	38	32	64
100 to 124	41	34	68
125 to 149	44	36	72
150 to 199	47	38	76
200 to 249	50	40	80
250 to 299	52	42	84
300 to 349	54	44	88
350 to 399	56	46	92
400 to 449	58	48	96
450 to 499	60	50	100
500 to 549	62	52	104
550 to 599	64	54	108
600 to 649	66	56	112
650 to 699	68	58	116
700 to 749	70	60	120
750 to 799	72	62	124
800 to 849	74	64	128
850 to 899	76	66	132
900 to 949	78	68	136
950 to 999	80	70	140

[1] For vessels over 1,000 gross tons, 8 cents per gross ton per single passage.
[2] For vessels over 1,000 gross tons, 7 cents per gross ton per single passage.
[3] For vessels over 1,000 gross tons, 14 cents per gross ton per round trip. Payment of tolls to be made when vessel enters canal. Vessels not returning within 10 days can obtain refund or credit for return ticket, based on difference between single passage rates and round trip passage rates.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

[Superseding all previous notices relative to toll rates for vessels of Class B.]

The following toll rates, subject at all times to change or cancellation without notice, and effective this date are not for vessels which have to make a fixed schedule time between ports and which require immediate passage through the canal:

	Tolls for vessels engaged in commercial trade (includes passenger vessels and freight vessels carrying other than crude material), per single passage.[1]	Tolls for tugs when having no tow, per single passage.
For vessels less than 16 gross tons based on length over all:		
Minimum less than 30 feet	$5.00	$3.00
30 to 34 feet	6.00	3.50
35 to 39 feet	8.00	4.00
40 to 44 feet	10.00	5.00
45 to 49 feet	12.00	6.00
50 to 54 feet	14.00	7.00
55 to 59 feet	16.00	7.50
60 to 64 feet	18.00	8.50
65 feet and over and less than 16 gross tons	20.00	10.50
For vessels over 16 gross tons:		
16 to 19	21.00	10.00
20 to 24	23.00	10.50
25 to 29	25.00	11.00
30 to 34	27.00	11.50
35 to 39	29.00	12.00
40 to 44	31.00	12.50
45 to 49	33.00	13.00
50 to 74	35.00	14.00
For vessels over 16 gross tons—Continued.		
75 to 99	$38.00	$15.00
100 to 124	41.00	16.00
125 to 149	44.00	17.00
150 to 199	47.00	18.00
200 to 249	50.00	19.00
250 to 299	52.00	20.00
300 to 349	54.00	21.00
350 to 399	56.00	22.00
400 to 449	58.00	23.00
450 to 499	60.00	24.00
500 to 549	62.00	.....
550 to 599	64.00	.....
600 to 649	66.00	.....
650 to 699	68.00	.....
700 to 749	70.00	.....
750 to 799	72.00	.....
800 to 849	74.00	.....
850 to 899	76.00	.....
900 to 949	78.00	.....
950 to 999	80.00	.....

[1] For vessels over 1,000 gross tons, 8 cents per single passage.

The toll rates for pile drivers, drill boats, dredges, wrecking outfit, and commercial vessels not licensed to carry passengers or cargo are not included in the above tolls as formerly. Owners of such vessels should apply to the superintendent for rates.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

[Superseding all previous notices relative to toll rates for vessels of Class C.]

On and after September 8, 1916, the separate schedule of toll rates, including towage, for commercial schooners of 100 tons capacity or over, known as Class C1, dated November 5, 1915, will be canceled, and the following rates will be effectlve for all schooners and all other vessels engaged in carrying crude material.

On and after September 8, 1916, the Boston, Cape Cod & New York Canal Co. will not tow vessels through the canal.

A separate organization, known as the Cape Towing Corporation, has arranged to provide tugs for towing through the canal. All vessels requiring the services of a tug

should, from and after September 8, 1916, make their own arrangements with the Cape Towing Corporation or any other towing company.

The towing charge will be in addition to the tolls to be charged by this company.

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

	Tolls for vessels—			Tolls for vessels—	
	Carrying crude material in bulk cargo lots, and fishing vessels, for a vessel with cargo per single passage.[1]	Having no cargo, but empty or in ballast, per single passage.[2]		Carrying crude material in bulk cargo lots, and fishing vessels, for a vessel with cargo per single passage.[1]	Having no cargo, but empty or in ballast, per single passage.[2]
For vessels less than 16 gross tons, based on length over all:			For vessels over 16 gross tons:		
Minimum less than 30 feet	$4.00	$3.00	16 to 24	$12.00	$9.00
30 to 39 feet	5.00	4.00	25 to 34	14.00	9.50
40 to 44 feet	7.00	5.00	35 to 49	18.00	10.00
45 to 49 feet	8.00	6.00	50 to 74	21.00	10.50
50 to 59 feet	9.00	8.00	75 to 99	24.00	11.00
60 feet and over and less than 16 gross tons	12.00	9.00	100 to 124	27.00	11.50
			125 to 149	30.00	12.00
			150 to 199	33.00	12.50
			200 to 299	37.00	13.00
			300 to 399	39.00	14.00
			400 to 499	40.00	15.00

[1] Vessels over 500 gross tons will be charged on the basis of their having on board 800 tons of cargo at 5 cents per cargo ton per single passage. Vessels having on board over 800 cargo tons 5 cents per cargo ton single passage.

[2] Vessels over 500 gross tons without cargo 3 cents per gross ton per single passage.

The total tonnage of cargo in vessels in tow is to be computed as if on board a single vessel.

Tolls include the towing tug provided by the owners of barges or schooners.

Vessels carrying cargo by measurement must reduce it to tons.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, March 26, 1917.

CAPE COD CANAL TOLL RATES FOR COMMERCIAL SCHOONERS AND ALL CRUDE MATERIAL CARGO VESSELS PROPELLED BY THEIR OWN SAIL POWER—CLASS C1.

[Superseding all previous notices relative to toll rates for vessels of class C1.]

The following toll rates through canal are subject at all times to change or cancellation without notice, and are effective this date for commercial schooners and sailing vessels propelled by their own sail power carrying crude material and having a cargo capacity of 100 tons or over.

Barges, boxes, and other such vessels do not come under this class.

Tolls for loaded or light schooners and sailing vessels of 100 tons capacity or over carrying crude material in bulk cargo lots on the carrying capacity of vessel per single passage.

Tons capacity:		Tons capacity:	
100 to 149	$16	450 to 499	$26
150 to 199	17	500 to 549	27
200 to 249	19	550 to 599	29
250 to 299	20	600 to 699	31
300 to 349	21	700 to 799	33
350 to 399	23	800 to 899	37
400 to 449	25	900 to 999	40

Schooners and sailing vessels having a capacity of 1,000 tons or more, 4 cents per cargo ton.

The definition of carrying capacity is the maximum amount of coal that a vessel can carry. Bills of lading must be submitted to toll collectors. A vessel loaded with lumber or other commodity lighter than coal shall pay tolls based on the full coal capacity tonnage.

In all other respects the class C schedule of tolls dated September 8, 1916, for barges, boxes, fishing boats, and other such vessels having a cargo-carrying capacity less than 100 tons to remain in full force and effect.

The rates above are effective only for commercial schooners and sailing vessels propelled by their own sail power carrying crude material and having 100 cargo tons or more on board.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

[Superseding all previous notices relative to toll rates for Government vessels.]

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

Class D tolls for Government vessels shown in Government books under gross tonnage, and as entered in ship's data book for displacement normal.

FOR VESSELS LESS THAN 16 GROSS OR DISPLACEMENT TONS BASED ON LENGTH OVER ALL.

Minimum less than 30 feet	$8	50 feet to 54 feet	$20
30 feet to 34 feet	10	55 feet to 59 feet	22
35 feet to 39 feet	12	60 feet to 64 feet	25
40 feet to 44 feet	15	65 feet and over and less than 16 gross or displacement tons	30
45 feet to 49 feet	17		

FOR VESSELS OVER 16 GROSS OR DISPLACEMENT TONS.

16 to 19 tons	$30	1,050 to 1,099 tons	$104
20 to 24 tons	31	1,100 to 1,149 tons	106
25 to 29 tons	32	1,150 to 1,199 tons	108
30 to 34 tons	33	1,200 to 1,249 tons	110
35 to 39 tons	35	1,250 to 1,299 tons	112
40 to 44 tons	37	1,300 to 1,349 tons	114
45 to 49 tons	40	1,350 to 1,399 tons	116
50 to 74 tons	45	1,400 to 1,449 tons	118
75 to 99 tons	50	1,450 to 1,499 tons	120
100 to 124 tons	55	1,500 to 1,599 tons	124
125 to 149 tons	60	1,600 to 1,699 tons	128
150 to 199 tons	65	1,700 to 1,799 tons	136
200 to 249 tons	70	1,800 to 1,899 tons	144
250 to 299 tons	72	1,900 to 1,999 tons	152
300 to 349 tons	74	2,000 to 2,099 tons	160
350 to 399 tons	76	2,100 to 2,199 tons	168
400 to 449 tons	78	2,200 to 2,299 tons	176
450 to 499 tons	80	2,300 to 2,399 tons	184
500 to 549 tons	82	2,400 to 2,499 tons	192
550 to 599 tons	84	2,500 to 2,999 tons	200
600 to 649 tons	86	3,000 to 3,999 tons	240
650 to 699 tons	88	4,000 to 4,999 tons	300
700 to 749 tons	90	5,000 to 5,999 tons	360
750 to 799 tons	92	6,000 to 6,999 tons	420
800 to 849 tons	94	7,000 to 7,999 tons	480
850 to 899 tons	96	8,000 to 8,999 tons	540
900 to 949 tons	98	9,000 to 9,999 tons	600
950 to 999 tons	100	10,000 and over, 6 cents per gross or displacement ton.	
1,000 to 1,049 tons	102		

Fuel and supply vessels over 1,000 gross or displacement tons when empty or in ballast, 5 cents per gross or displacement ton per single passage.

The CHAIRMAN. There was in my mind some doubt. You say 5 cents for cargo. Does that include the tonnage of the vessel and the cargo tonnage?

Mr. MILLER. No, sir. That is the amount of crude material, coal or lumber, etc., which she may have aboard. Then, when the vessel returns light, as most of them do from Boston, we charge 3 cents on what is known as her gross tonnage.

The CHAIRMAN. Yes.

Mr. MILLER. We originally made the rate for the return trip, but many shippers objected as they did not know whether their vessels would return through the canal or not.

Senator RANSDELL. When they have cargo, you make your estimate on the actual cargo carried rather than on the gross tonnage?

Mr. MILLER. Yes; always, as it was fairer to make the charge based on the cargo, which is the earning power.

Senator RANSDELL. Have you had much complaint about the tonnage dues being a heavy burden on the commerce?

Mr. MILLER. Well, naturally, everybody wants things cheap in this world if they can get them. There has been little or no complaint lately. When the canal was closed last winter on account of the wreck, all our patrons were wiring to know how soon they could get through.

The CHAIRMAN. You are practically operating that canal at its capacity now?

Mr. MILLER. No; we could take a great deal more.

Senator WEEKS. How about vessels going through at night?

Mr. MILLER. The canal is illuminated on the street system lighting, with electrical lights every 500 feet. Capt. Colbeth, the superintendent of the canal, can tell you about that. Capt. Colbeth, do you find it just as easy to take vessels through at night as in the daytime?

Capt. COLBETH. Yes.

Mr. MILLER. In addition to the electric lights every 500 feet through the prism, we have dolphins and other lights every 1,000 feet in the approach channel.

The CHAIRMAN. It can be used night or day practically all the year around?

Mr. MILLER. Practically all the year around. A year ago we had no trouble with ice. This past winter some trouble. It was an unusually warm winter with short intervals of very cold weather. The ice broke up during these intervals and floated about in an unusual manner. In addition to this, the canal was closed on account of the wreck. If we had been operating, we could have minimized this difficulty by cutting a lane through the solid ice as is done in the neighborhoods of Boston and New York. There is no ice in Cape Cod Bay.

Senator WEEKS. It is a better channel than at Boston or New York?

Mr. MILLER. The average temperature is about 11° higher in the winter than it is in Boston. The gulf stream runs close to the cape.

Senator WEEKS. There is little snow on Cape Cod?

Mr. MILLER. Yes. I would state incidentally, also, that the wrecks off Cape Cod and in Vineyard Sound amount to about half a million a year.

Senator RANSDELL. Do you mean a half a million tons, or a half a million dollars?

Mr. MILLER. Dollars.

Senator WEEKS. I have some figures on that which I wish to put in the record.

The CHAIRMAN. Is it your opinion that commerce along the coast has been increased by reason of the building of this canal?

Mr. MILLER. My observation shows that there has been about the average normal increase.

The CHAIRMAN. There is some testimony to the effect that boats have been used through this canal that could not have been used in commerce along the coast if it had not been for the canal?

Mr. MILLER. To the extent that a former witness spoke of, namely, what are known as "boxes." They have licenses from the Government to use this as an inland channel. They have never had permission and never will have it to go outside. These "boxes" transport freight cheaper than the sea-going barges.

Senator WEEKS. There is another instance—as to the through New York to Boston passenger service?

Mr. MILLER. Yes. That is a well-established system.

Senator WEEKS. It would not be possible to maintain that service without the canal?

Mr. MILLER. No; the canal is the making of the passenger line between Boston and New York. Their boats have doubled their passenger business while going through the canal, for the reason that people are afraid of the outside passage, and the loss of time, and not being certain when they will arrive at the terminus.

The CHAIRMAN. Is there anything else, Senator?

Senator WEEKS. Mr. Jesse Baxter is here and would like to be heard.

The CHAIRMAN. Proceed, Mr. Baxter.

STATEMENT OF MR. JESSE BAXTER.

Mr. BAXTER. Mr. Chairman, I was unavoidably absent this morning, but I have listened to what was said this afternoon, and I want to agree with all that has been said as to the desirability of taking over the canal by the Government, from both the naval and the commercial viewpoints.

It would seem to me that as the Attorney General has ruled that this is governmental water through there the desirability of doing away with tolls and making that free to all shipping is urgent, and thereby doing away with the hazards that so many ships take by going around on the outside passage in order to save that toll.

I would also like to call your attention to the fact that this is a live company. They have succeeded in two years in getting about 4,000,000 tons through there, and they have a field of a total of 20,000,000 tons to 25,000,000 tons to draw from, and although some of them may never be able to go through there—the coal barges and vessels of that kind—they are constantly going to increase their business, and as their business increases the cost to the Government, when they come to purchase the canal, will be increased proportionately.

Mr. Cole, the chairman, covered the ground very carefully this morning, and although I have not heard what Mr. McNary said to-day, I know from his general knowledge of the subject that he has given you a great deal of useful information. If there is anything you want to ask me about that I know, I would be glad to answer it.

The CHAIRMAN. I think we have very well covered the subject now, except that Senator Weeks will make a statement.

STATEMENT OF HON. JOHN W. WEEKS, UNITED STATES SENATOR FROM THE STATE OF MASSACHUSETTS—Resumed.

Senator WEEKS. Mr. Chairman, owing to the limited time which the committee can give to a hearing on this important subject now, I do not wish to present any other witnesses, but many questions have arisen during the hearing to-day which have not been completely answered, and much additional testimony might be included in the hearing. I therefore wish to submit statements bearing on testimony which has been presented by witnesses, and other pertinent questions relating to the canal.

Before doing so, however, I wish to express the view that so important a link between the two great ports of New York and Boston, quite apart from the interests of the general coastwise traffic, should, at this critical time, be absolutely under the control and in the possession of the United States Government.

To those who base their future course with regard to all public matters on the accepted theory that this war is to be confined to Europe and its shores only, I have but to point to the immediate disturbance that occurs in our coastwise traffic the moment there is a rumor of the appearance of a submarine on this coast.

I do not think our Government should base its plans on an accepted certainty that we may not in the end have to defend ourselves against possible attack. That is not in the line of wise preparedness.

No one to my knowledge questions the wisdom of this great waterway being acquired by the Government. Therefore why not acquire and deepen it now rather than to let it go until the necessity would point out the mistake of not having acted promptly.

If the sum involved was a vast one and one which might be a burden, it could well be postponed and I might be less urgent.

The sum I understand the canal can be acquired for is not an unreasonable one, and I have been told by expert engineers that it could not have been built for this sum by the United States Government.

I understand that some subcontractors lost heavily in its construction, and the work had to finally be finished at cost under the direct management of those interested in the enterprise.

Engineers familiar with the work assure me that the widening and deepening can be accomplished well within two years, but the deepening alone, which would very substantially serve our Government's requirements, would take not more than a year.

Quite apart, however, from this, should not the deepening and widening synchronize with the construction of our dreadnaughts? Why should we wait until more large vessels are built, and then perhaps too late for the effective use in time of need, and suffer losses far greater than the cost of this waterway?

The whole waterway would be of a less cost to the Government than one superdreadnaught.

The only dry dock of sufficient size to really accommodate the largest of our war vessels so far designed is at Boston.

A crippled ship should be transferred from the navy yard to Boston through Hell Gate, through the Sound, and through the Cape Cod Canal to that dock. We had an illustration only recently when the *Salem*, one of our scout cruisers, was towed through the canal, much to the relief of the naval authorities. The vessel is 426 feet long, 46 feet beam, and was passed through the canal with the assistance of three tugs.

The same could be done with crippled battleships, but for this we must have a wider and deeper waterway.

By chapter 448 of the act of 1899, the Boston, Cape Cod & New York Canal Co. was incorporated and authorized to construct and operate a ship canal between Barnstable Bay and Buzzards Bay, subject in certain respects to the approval of the railroad commissioners, now the public-service commissioners, and the board of harbor and land commissioners, sitting jointly or separately, as and for the purposes in the act prescribed.

By chapter 476 of the acts of 1900, the act of 1899 aforesaid was amended, providing that if a contract or contracts should be entered into by the corporation, by the terms of which capital stock and bonds should be issued in payment for labor to be performed or materials to be furnished in the construction and equipment of the canal in accordance with plans approved by the board of harbor and land commissioners, and such contract or contracts be approved by said joint board (the railroad commissioners and harbor and land commissioners) after such advertisements for bids thereunder as shall be satisfactory to said joint board and provided such contract shall be awarded to the lowest bider satisfactory to the joint board, the corporation might issue its capital stock and bonds from time to time, pro rata to the labor performed and the materials furnished on the certification furnished by the joint board that such work had been done or such materials furnished and in accordance with the terms of any such contract.

On May 8, 1907, the harbor and land commissioners approved plans for the location and construction of the canal.

On June 3, 1907, the joint board approved a contract between the canal company and the Cape Cod Construction Co. for the construction and equipment of the canal in accordance with plans approved by the harbor and land commissioners, and with all the requirements of the act of 1899 aforesaid, as amended by chapter 476 of the acts of 1900, by the terms of which capital stock and bonds of the canal company were to be issued in payment for labor to be performed and materials to be furnished.

The actual construction of the canal was commenced on August 19, 1907.

In June, 1909, the construction of the breakwater at the Barnstable Bay end of the canal was commenced.

I submit also a letter from Gen. Tasker H. Bliss to Maj. Gen. Arthur Murray, United States Army, retired, dated February 21, 1916:

"My Dear Murray: I have just received your letter of the 19th instant, inclosing a copy of yours of the 18th instant to Gen. Wood on the subject of submarines as adjuncts to our coast defenses.

"You ask me to give my views on each of the three following questions: * * *

"2. The strategic value of the proposed intracoastal waterway in connection with the defense of the Atlantic coast, etc.

"The intracoastal waterway along the Atlantic, which has been studied by the Corps of Engineers for nearly a hundred years, and which has been the subject of resolutions of Congress over many years, is the following: Beginning in Cape Cod Bay it passes by canal to Buzzards Bay; thence via Long Island Sound to New York Harbor; thence by the Raritan River and the Delaware and Raritan Canal to the Delaware River; thence by the latter river and the Delaware & Chesapeake Canal to the Chesapeake Bay; down the Chesapeake to Hampton Roads and up the Elizabeth River; thence by the Dismal Swamp Canal and the Albermarle & Chesapeake Canal to Albermarle Sound; thence through the swamps and landlocked sounds and lagoons of the Carolinas and Georgia to Florida; thence across the neck of Florida by canal, slack water, and open-river navigation from St. Marys on the Atlantic to St. Marks on the Gulf of Mexico, and thence by interior sounds and bays to the Mississippi.

"The impediments to making navigable the entire route above outlined were never insuperable nor even very great. Some of them have already disappeared before the energy of private and State enterprises, while considerable work has been done by the Government and many costly surveys have been made. The board of officers appointed by the President under a joint resolution of Congress, 1884, considered it of very great importance both from a military and a commercial point of view. This board, in its preliminary study, examined all the information that then existed, but requested an appropriation of $10,000 to make certain special surveys before it could submit its final report. There was no widespread interest in the subject at that time, the appropriation was not made, and no further work was done by the board.

"The completion of the entire route for navigation would give us a second and interior coast line, separated from the Atlantic and the Gulf by a navigable channel. Our most distinguished engineers have represented the great value it would be to us in time of war. It would enable us to transfer certain classes of our war vessels, in the presence of a superior enemy naval force, from one point of our coast to another. And, what is perhaps of equal importance, would preserve our vast coasting trade in unimpaired activity in spite of a blockade.

"With reference to your second question, I do not think there can be any doubt as to the great value of this inner waterway in assisting the general defense of our coast by facilitating the movement of troops and light and heavy artillery to operate against relatively small landing parties.

"3. The strategic value of the Chesapeake & Delaware Canal * * * if completed * * * and also the strategic value of the Cape Cod Canal * * * provided that it also be fortified and operated by the Government.

"Of the entire interior waterway along the Atlantic coast, outlined above, by far the most important part is that which extends from Cape Cod Bay to the Chesapeake. In this there are only three links to be considered: (1) Cape Cod Bay to Buzzards Bay, (2) New York Harbor to the Delaware River, and (3) the Delaware River to Chesapeake Bay.

"1. The Cape Cod Canal is completed for present use. It will enable submarines, destroyers, light-draft cruisers, and barges carrying heavy mobile artillery to pass by an inner waterway from a base at New York or in Long Island Sound to Massachusetts Bay. * * *

"If, however, it should be necessary to enlarge this canal beyond the resources of private enterprise the Government might have to take it over for all purposes in peace or war. * * *

"There is no doubt that it should be protected from a sudden sea raid. * * *

"2. The New York-Delaware River route is not in such a status as to warrant present discussion, beyond pointing out the enormous value that its canalization would have, both commercially and from the military point of view. Could it and the Delaware River-Chesapeake route be completed on the scale of the Cape Cod Canal it would do more than any other thing to guarantee us against invasion (even if our sea power was lost) anywhere between northern New England and the lower Chesapeake. Immediately back of this line is concentrated the very vitals of our country. And the advantage of constructing this line is that the coast is not a dead line, because the work will pay for itself in times of peace. * * * "

I submit an excerpt also from a letter from Gen. E. M. Weaver, addressed to Maj. Gen. Arthur Murray, United States Army, retired, dated March 3, 1916:

"There can also be no question, in my opinion, as to the strategic value of such an inshore waterway as you mention. We have at the present time the Cape Cod Canal, the interior water line from the eastern entrance of Long Island Sound to New York, the Chesapeake & Delaware and the Delaware & Raritan Canals. If the two latter canals could be deepened so as to admit of the passage of submarines, destroyers, and other small craft, it would be of great strategical value both from a naval point of view and for coast-defense purposes. In this connection you have in mind, of course, the paper written by Gen. Bliss (then Lieut. Bliss) in 1884, which I remember having read at the time and which, in my opinion, fully sets forth the strategical advantages of such an interior waterway."

I also ask to have inserted in the record the following part of an address of the Secretary of the Navy, Hon. Josephus Daniels:

"THE INTRACOASTAL WATERWAY IN THE NATIONAL DEFENSE.

"[From the addresses by Hon. Josephus Daniels, Secretary of the Navy, at the seventh annual convention of the Atlantic Deeper Waterways Association, Albany and Troy sessions, Sept., 1914.]

"It is a marvel: when you look at the coast line from Boston to New Orleans it seems as if Providence had lifted up a sand barrier between the hinterland and the tumultuous sea and bade us to go in and make it deep enough to float the navies of the world. Since Providence has put that work within our reach, it would be national suicide for us to fail to follow the lead.

"There are no ships in the Navy so delicate as our submarines and destroyers, and when we send them on long cruises it costs thousands of dollars to repair them after they have had to go on the high seas. If we had this canal, these ships of light draft could go from one end of the Atlantic coast to the other, and the saving of the navy-yard cost today in repairs would pay the interest on the investment; and this in time of peace when we have not many of these craft, when we have not so many as we must have if we learn the lesson of the war in Europe.

"You will recall how a submarine, affecting to be distressed, off Helgoland managed to induce a German ship to come out into the open, and how a large English ship came and destroyed it; and you recall that a German submarine coming from under the surface of the ocean, from where nobody knew, sank three British cruisers. The lesson in that is that future warfare on the sea will be more and more largely controlled

by submarines and small craft. We shall not, indeed, change the policy of building dreadnaughts, nor put our eggs all in one basket, but we have seen as never before proofs of the naval experts' opinion that the submarines and destroyers will exert more power in war than men have any dream of.

"I need but illustrate what the Kiel Canal is worth to Germany for you to see the incalculable importance of this canal to the Navy. The English Navy is larger than the German Navy, and the German Navy there is protected by this Kiel Canal. Its officers, its men, quietly go about their daily duties on their ships, while every English ship in the channel has to compel every man to be on the alert, hardly having sleep. The purpose of the German Navy seems to be to dart out into the North Sea and deliver a blow. In the meantime its own fleet is in no danger. If we should be so unfortunate as to be attacked, more than the dreadnaughts, more than the coast defenses, more than the Army, would be our ability to send through every channel these death-dealing submarines into the ocean and prevent any foreign navy landing on our coast; so that when you are advocating this inland waterway, when you have the vision to see its importance to commerce—and I put that as the reason why the money should be forthcoming to construct this canal—still you see that in any emergency it would be vitally important to the national life that our ships, when the occasion called, should be in harbor, protected, ready to save our cities and our people.

"If this canal was constructed you could take these submarines and destroyers from Boston to New Orleans in these inner channels without hurt or injury. That is for peace. But if we should be so unfortunate—and I pray God we may never see it—as to have war, then the possession of an inland waterway channel would be essential to preserve efficiency and to enable us to defeat our opponents, because these little craft could ply to and fro, and dart out and deal a blow and return with little injury to themselves. That is the argument on the side of national defense.

"There is one other argument which I will give you most briefly in favor of this inland waterway canal. It is an argument for the preservation of human life. We have thought too little, until recently, of the lives of men who go down to the sea. We have, in Congress and as a people, permitted conditions that have sacrificed the lives of men for commerce and trade on the sea, and until the *Titanic* disaster we never had even the beginning of proper protection and proper laws. I wish to give you the disasters to vessels on the Atlantic and Gulf coasts during the 10 years from 1899 to 1909. The number of vessels is 5,715. Loss to the vessels, known, $30,000,000; loss to the cargoes, known, $10,000,000. Vessels totally lost, 1,675; vessels damaged, 4,040. Tonnage totally lost, 483,743; tonnage damaged, 3,289,200. Lives lost, 2,223. The total cost of the Atlantic intracoastal waterway would be $47,800,000; so that if we could save a tithe of this material loss we could in a few years pay every dollar of the cost of these improvements which your association is advocating.

"But who shall estimate the value of a human life; who shall put a money value upon the lives of the men sacrificed, when for a few million dollars, we might make navigation easy and safe?"

I submit also the following excerpts from an article written by Lieut. Commander A. St. Clair Smith, United States Navy, entitled "Intracoastal Waterways—the Cape Cod Canal."

"A canal up and down our east coast, or along any portion of it, is a military asset of great and undisputed value. We want them. * * * In 1909 provision was made by Congress for a thorough survey and report by the Engineer Corps, United States Army, as to the feasibility of the intracoastal waterway from Boston to Beaufort, N. C.—this in response to the demands of our east coast trade. A private company has grasped the most important link in the chain and is constructing the Cape Cod Canal. The soundness of the business judgment that has built this canal will be increasingly apparent to us all as time goes on. Canada has undertaken the very extensive task of deepening the St. Lawrence River for ocean traffic to Montreal, and this is undoubtedly but the first step toward realizing the possibilities of her many natural waterways. * * *

"The extreme importance of the question of transportation has long been recognized and the Interstate Commerce Commission has had no question of more moment before it than that of transportation rates. Railway rates are high and probably will always be so, compared to water rates, at least. The present very emphatic demands by the railways for increases in these rates seem to indicate that, lacking very much increased facilities, such as water transportation, there is small chance of relief, or, indeed, little to be expected other than further advances.

"The field, then, for canals seems enormous. It seems clear that their construction is bound to follow as soon as it is evident that there will be adequate return for the large amount of capital involved. This is as true for canals constructed by the Government as it is for those built by private capital. A very considerable opposition will develop, no doubt, and will perhaps be most vigorous from those who con-

trol the immediate competing lines. Railroads having long held the control of all facilities will see danger to themselves. Indeed, there is good evidence that protection from difficulties in this direction has been already sought in getting control of terminal facilities at many ports likely to be affected. However, opposition of this character, while vigorous and hindering at the start, will not be lasting. The history of the Manchester Ship Canal shows much opposition, particularly from Liverpool, which feared a loss to her shipping interests. The completion of the canal, however, has actually increased the tonnage of the port of Liverpool rather than lessened it. The same is true in Germany. She has doubled her railway mileage in the last 30 years, whereas the tonnage carried over these lines has quadrupled. The water mileage, which, on the other hand, has not materially changed, has increased its tonnage five times. Our own railways opposed the opening up of water transportation on the Lakes, but the figures show that the opening of these same waterways has been one of the largest factors in the growth of the railways themselves. Furthermore, a waterway once well started and with a section built is very sure to grow and add to itself new lengths. Each unit adds materially to the strength of the whole by lengthening the haul and opening up new territory—and this seems to be even truer than of a railway.

"The Cape Cod Canal was the most serious attempt in many years at a commercial canal in this country. This locality has always seemingly offered the greatest advantages for the least effort. As early as 1697, the General Court of Massachusetts appointed a committee to survey a route across the neck of land separating Cape Cod and Buzzards Bay. From that time until the present day the matter has been under consideration either by the Government, by shipowners, or by capitalists. The distance is but 8 miles and the surface is low, and seemed to offer small engineering difficulties. The avoidance of the dangers of the outside routes was most advantageous, and the amount of traffic going around Cape Cod has for many years been very great. But the various attempts up to now have all ended without the canal being completed.

"The northern entrance of this canal is 30 miles in a southerly direction from Boston. Here, off the town of Sandwich (Barnstable Bay), a stone jetty, 3,000 feet long, has been built to protect this entrance of the canal. Minor dredging operations behind this breakwater have provided a basin and an approach for the canal itself. The latter, which is 7¾ miles long, cuts through the marsh and high land of the neck connecting Cape Cod with the mainland of Massachusetts. The so-called high land, however, is but 29 feet above high water, and the soil is principally sand, interspersed with occasional bowlders. Four miles of dredging in the upper end of Buzzards Bay connect the canal proper with deep water at the southern end. The canal prism is a cut, which is at first to have a depth of 25 feet, with a bottom width of 100 feet in the narrowest parts. The northern approach proper has a bottom width of from 200 to 300 feet for a distance of 7,000 feet, and the southern approach has a 200-foot width for a considerable distance. There are also two points of passage in the canal itself where the width is 250 feet.

"The distance of this southern end from New York is about 220 miles (statute), and of this all is protected, except the 60 miles between Point Judith and the entrance of Buzzards Bay. Even here there are several safe harbors of refuge that are easy of access. The outside route, i. e., through Vineyard Sound, but around Cape Cod, has a length of 334 miles (statute), so that the saving is about 60 nautical miles from Boston to and from all southern ports. The saving for vessels going around the Nantucket South Shoal Light Ship is 144 miles.

"The saving of time due to this saving of 60 miles to vessels averaging a scant 4 miles an hour amounts, in a year, to a very considerable amount; but there will be really much greater saving due to the curious differences in the weather conditions in the two localities traversed. This is principally due to the difference in the percentage of fog along the different routes. At the Pollock Rip Light Ship the record shows an average of 1,082 hours of fog per annum, compared to 277 hours at the southern entrance and 564 hours at the Sandwich entrance of the canal. Leaving aside other dangers to navigation this means that vessels using the canal will have less than half the fog to contend with that those rounding the cape will have. When, however, the uncertain currents of the Nantucket Shoals and the dangerous storms that have made this section the graveyard of so many ships are taken into consideration, the saving and freeness from risk of the canal route will become more apparent. The number of vessels wrecked on this particular section of the coast has averaged 35 a year for 50 years, and it is interesting to note that the outside rate for marine insurance is 8 to 12 per cent, whereas the inside rates, i. e., lake and river, are but 4. When the proposed coastwise canals are completed there is no reason to believe that the rate for vessels using these routes will be much in advance of the inside rates.

"A further very material saving will be made in the original cost of the vessels engaged in carrying what now goes outside. It is somewhat startling for a seafaring man to find that the cost per ton for construction of ocean-going vessels is $75, whereas the cost for lake vessels is $41.50 per ton, and for tugs and barges, such as are used on rivers and other protected waterways, is but $12 per ton. We are so used to our own heavily built ocean-going craft that we do not realize that vessels can be built for half or less, that are not only perfectly satisfactory for the service demanded, but also can be insured for less than half of what is demanded at sea. This is probably not a measure of the comparative dangers of the sea and the lakes, but it certainly is a pointer in that direction.

"As soon as the canal is completed the savings due to the shorter distance and to the avoidance of fog will begin to be felt. It seems, however, that perhaps the greater part of the present delay is due to waiting for favorable weather to get past dangers of the coast. With these dangers cut out progress will be just so much faster. In this respect it is an interesting fact that the speed of tugs and barges up and down our coast is seldom more than 3 to 4 knots an hour, and in rough weather is frequently less. This means that the canal will cause no delay to this class of traffic due to having to slow down. Indeed, a 3,000-ton barge, which is the commercial size which seems most desirable at present, can be permitted to tow through a 25-foot canal at some 9 knots without damage to the canal prism. The usual speed for steamers of about 23 feet draft will be about 5 knots. There is no reason to suppose that these speeds can not be maintained at all seasons. The possible difficulties due to ice in winter are not likely, because of the fact that quiet reaches of rivers in the vicinity have seldom been so frozen as to endanger or delay traffic. When allowance is made for salt water, it seemed doubtful if the ice question need be given serious consideration.

"Turning to the question of the commerce of New England and its economic conditions, we find that this canal should have no lack of business. The water-borne commerce alone, which has been of recent years going around Cape Cod, amounts to 25,000,000 tons annually. This is only a part of the product going to and from the 4,681 manufacturing plants of this part of New England. The value of these plants is in round numbers $375,000,000, and the value of their products is $430,000,000. The value of the water-borne tonnage using waterways tributary to this canal is $527,000,000. This is composed at present largely of raw materials, such as coal, oil, plaster, lumber, etc. The finished products are largely handled by the railways, and the freight rates for this section of the country show that transportation here is more expensive than anywhere else in the United States except California. The average ton-mile revenue in the United States is $0.759, whereas the revenues in New England are $1.145 and those on the New York, New Haven & Hartford Railway are $1.436, nearly twice as much as the average. This would seem to indicate that the entrance into the field of any competitive carrying organization would lessen materially the cost of the many products carried back and forth.

"The comparative carrying abilities of such a canal as the Cape Cod Canal, in reference to a railroad, present astonishing figures. The comparison is more or less rough, perhaps, and is made for a maximum load in both cases, but it is as true for lesser loads. Taking a double-track railway (each way) it is figured that this would permit of 75 trains being dispatched per day.

"Double-track railway freight-line capacity is 168,750 tons per day each way. This is for a minimum headway of 75 trains per day and a speed of 18 miles (average) per hour. Length of trains is 45 cars of 50 tons each.

"The freight movement by a canal is estimated as follows: With vessels of 3,000 tons capacity spaced 5 to the mile and running 6 miles an hour the freight movement would be 2,160,000 tons per day (one way), nearly thirteen times as great.

"Both quantities seem exaggerated, though the comparison is probably of value. It should also be borne in mind that the chance of interruption of a waterway is very much less than it is for a railway.

"The comparative expenditures for the two show no such discrepancies as the comparative capacities. A double-track railway, including bridges, through a well-populated, rolling country, costs, roughly, $75,000 to $100,000 a mile. A mile of waterway, through the same sort of country but without any large engineering undertakings, is about $490,000 per mile; say, 1 to 5.5. However, capacity to carry such large amounts as these depends as much on the terminals as on the transportation lines themselves, and only the most ample terminal facilities could handle the loading and unloading of these quantities.

"There is no question, however, of the immense advantage of the canal over the railway, and while this is true of peace times it becomes very much more so when considered from a military standpoint. The transportation of the ordinary commercial articles is generally done in much smaller sizes and amounts than those

necessary for war times. Large articles are not, in peace times, ordinarily moved under such pressure as our big guns, forgings, armor plate, etc., are likely to be in war times. These and other war materials lend themselves very much more readily to water transportation than to rail. Take an Army division, for instance, to use an extreme case. Such a movement by water would be quite a sufficient task, and its many advantages to rail transportation will readily suggest themselves. But the congestion to railway traffic caused by the movement of a division for even a short distance may be imagined from the following estimate by Col. Schofield, of the Quartermaster's Department of the Army. When the movement is for any considerable distance the temporary loss of some of the units seems a certainty. To move, then, a division consisting of 19,850 officers and men and 8,265 horses, total, 142,172 gross tons, would require 395 passenger cars, 78 freight (box) cars, 344 stock cars, 144 flat cars (for wagons, guns, etc.); total, 958.

"It is easily seen that a single movement of this character would throw out of gear, as far as other traffic was concerned, for a considerable period the railway which attempted it. Water transportation is in every way to be preferred where possible, and it seems that the greatest military value of a canal would be its ability to handle the transportation of military units and of purely military and naval stores, leaving the railways to carry the newly made products that have to be assembled in such quantities in war time; field guns, small arms, ammunition, clothing, etc., but more important than all else, perhaps, foodstuffs.

"It is true that the ability to send by inland waters small units of the fleet might be of the most vital importance to us. Such movements, however, would pertain to defensive tactics only, while the movements of military units, stores, etc., would apply to both offensive and defensive tactics. That the ability to move submarines, torpedo boats, and eventually, battleships, along our coasts by intracoastal canals is most important would never be denied. That this time will come at a not too distant future seems evident to the writer.

"All the canals that the commercial interests finally bring to us may not be able to float a battleship; but that will not be necessary, though the Cape Cod Canal should be able to do so. But all the canals will probably be able to pass submarines and torpedo-boat destroyers, and they are bound always to remain our weakest units. Such ability in war time would be a feature so disturbing to a hostile commander on our coast that he would never feel certain that he was not in danger of a night attack by every minor craft that we possessed. The need of keeping his forces concentrated, or of an enormously superior force, is self-evident.

"Furthermore, the question of a blockade of our coast would become immensely more difficult to a hostile commander with the canals built. The connecting of the ports of Boston and New York by the Cape Cod Canal makes the first link in the chain, and one which will accomplish more than the building of any other link. History shows that the successful blockade of individual ports is difficult enough, but when this extends itself to the blockade of 500 miles of coast line, it becomes a task such that we may well accept the opinion expressed in the report of the Special Board of Engineer Officers, United States Army, as to these canals, House Document No. 391, 1912, that the United States will have an 'advantage which would make impossible an effective blockade of any one of these ports,' i. e., from Boston to the Capes of the Chesapeake."

I submit also excerpts from an address by Admiral William S. Benson, Chief of Naval Operations, Navy Department, delivered before the Thirteenth Annual Convention of the National Rivers and Harbors Congress, Washington, D. C., December 6, 1916. He said:

"One reason, I suppose, that the Navy has not taken a more active interest in inland waterways is largely due to the sailor's natural abhorrence of the land—particularly of the bottom—and, of course, for many years we had no vessels that would by any means be called upon to use inland waterways to any great extent; but, as you know, the motor power of vessels has changed from sail to steam and electricity and the internal-explosion engine, and their methods of getting about have so increased that we have a great many vessels, undoubtedly, connected with the naval service which can and should use the inland waterways extensively. * * *

"It may not be known to you that for some years now we have been supplying our naval stations along this eastern coast with coal for their use from colliers, because it was impracticable to get the coal carried in the ordinary way; so the Navy colliers had to supply the navy yards with coal sufficient to run them. * * *

"Now, all of our manufacturing interests making munitions of war along the eastern coast might be very seriously hampered for want of coal or proper fuel for carrying

on their work; and the railroads would be used for transporting men, soldiers, and so forth, and the ordinary equipment that goes with them. * * *

"Of course, anything that helps commerce helps the Navy; anything that helps the Navy helps commerce; and whatever helps both helps the country. * * *

"I thought I would just tabulate a few figures here in regard to the approximate distances between points on the Atlantic coast by the inside and outside routes, respectively."

Between Cape Cod Canal—	Approximate distances—	
	By Cape Cod Canal.	By outside route.
Boston Lightship-Brentons Reef	82	236
Boston Lightship-Sandy Hook	231	339
Boston Lightship-Hampton Roads	501	546
Race Point, Cape Cod-Race Rock, Long Island Sound	98	228

* * * * * * *

I ask to have inserted in the record the following report from the president of the canal company to the honorable Secretary of the Navy concerning the Cape Cod Canal, dated November 28, 1916:

"NOVEMBER 28, 1916.

"Hon. JOSEPHUS DANIELS,

"*Secretary of the Navy, Washington, D. C.*

"SIR: Replying to your letter of the 27th instant, and confirming conversation with you on November 20, I have the honor to submit for your consideration the following facts relative to the Boston, Cape Cod & New York Canal:

"HISTORICAL.

"From the day in May, 1524, when Cape Cod was sighted by Verrazzano from the decks of the Dauphine, to the end of the eighteenth century, the cutting of the narrow isthmus between Cape Cod and Buzzards Bay was discussed by the people of Massachusetts and the general court of the colony. It was not, however, thought of as a military necessity until 1776, when Gen. Washington ordered his engineer, Thomas Machin, to make a survey of the route which would "give greater security to navigation and against the enemy.'

"The following chronology shows the growing interest in such a canal, and attention is called to the work of State and governmental, especially naval, officers in the attempt to create a waterway through the upper part of Cape Cod:

"1780.—Gen. Henry Knox using influence to have Government build canal.

"1791.—John Hills and James Winthrop make survey.

"1798.—James Sullivan and others petition legislature to build.

"1803.—Committee appointed by legislature to interest people in project.

"1808.—Gallatin, Secretary of Treasury, advocated it as 'useful in time of war.'

"1812.—Isthmus used by small boats to avoid capture by enemy.

"1818.—Israel Thorndike and Thomas H. Perkins employed Loammi Baldwin to survey route; 5,000 ships rounding cape; United States Senate made survey for a canal sufficient to admit vessels of war.

"1824.—United States, under resolution of Senator Lloyd, ordered Maj. Perault to make survey; various Army officers reported route practicable.

"1825.—Further surveys made under Government orders until 1827.

"1828.—Government board reports on canal 36 feet wide, 8 feet deep, to cost $669,522.

"1844.—Lieut. G. S. Blake, United States Navy, survey.

"1860.—Renewed interest by Massachusetts and Government; surveys by Brig. Gen. J. G. Totten, Prof. A. D. Bache (Superintendent Coast and Geodetic Survey), Commander C. H. Davis (United States Navy), and Lieut. J. Wilkinson (United States Navy); report on 18-foot canal to cost $10,000,000.

"1870.—Charter to Cape Cod Ship Canal Co. to Alpheus A. Hardy and others; Maj. Gen. J. G. Foster, United States Army, examining route under orders; reports on practicability of 23-foot canal without locks.

"1870.—Senator Chandler introduces bill in Congress to pay for breakwater.

"1880.—Charter granted to Cape Cod Canal Co.; Henry M. Whitney and others interested; some work done, but project abandoned.

"1882.—Gen. G. K. Warren, United States Army engineers, reports to Government on canal and cost of approaches.

"Subsequent to the latter date various companies were formed, resulting, on June 1, 1899, with the charter to the Boston, Cape Cod & New York Canal Co., under which, and its amendments, the present corporation has since acted.

"LEGAL.

"The Boston, Cape Cod & New York Canal Co., which owns the canal, was incorporated by special act of the Legislature of Massachusetts, known as 'chapter 448 of the laws of 1899,' which, with the amendment of July 17, 1900, makes the charter of the company (a copy of which is hereto attached). This charter is perpetual, except only as the right is reserved by the State, after 20 years from date of opening the canal, to acquire by purchase all of the property of the canal by paying therefor such sum as will reimburse to it the amount of capital paid in, with a net profit thereon of 10 per cent a year from the times of the payment thereof by the stockholders to the time of purchase. The cost of the work was fixed by the Railroad Commission of Massachusetts, after submission to public letting, at $12,000,000.

"The charter gives the company the right to charge tolls, to collect the same, to build and operate wharves, and do other business in connection with the operation of the canal. It provides that the canal shall have a minimum depth at mean low water of 25 feet, and a minimum width on the bottom of 100 feet, with side slopes to be not less than 1 vertical to 2 horizontal.

"CONSTRUCTION.

"The construction of the canal was let to the Cape Cod Construction Co., a corporation with a paid up capital in cash of $1,000,000, which began its work in June, 1909. The canal commences at the head of Buzzards Bay, follows the valley of the Monument River, crosses the divide between Buzzards Bay and Cape Cod Bay, and enters the latter at point just north of the village of Sandwich. The distance between the shore lines of the two bays is about 8 miles, but inasmuch as the headwaters of Buzzards Bay are comparatively shallow, it was necessary, in order to get a depth of 25 feet at low water, to extend excavation for a distance of 4½ miles in Buzzards Bay to a point off Wings Neck Light, and to dredge a channel in Cape Cod Bay about one-half mile in length. The total length of excavated channel, therefore, from deep water in one bay to deep water in the other bay is 13½ miles. Although the charter provided for a minimum width of 100 feet, the canal company has constructed a very much larger canal, the minimum width being for a continuous stretch of 6 miles only. The bottom width in the other portions of the canal ranges from 150 to 300 feet in width, as follows:

100 feet in width	31,000 feet in length.
150 feet in width	1,500 feet in length.
200 feet in width	4,000 feet in length.
250 feet in width	29,000 feet in length.
300 feet in width	5,500 feet in length.

"In Buzzards Bay the mean rise and fall of the tide is about 5 feet, and in Cape Cod Bay it is nearly 10 feet, so that with a minimum depth of 25 feet at low water, there is a depth at high water varying from 30 to 35 feet.

"A right of way for the land portion of the canal, 600 feet in width for 6 miles, and 1,000 feet in width for 1¾ miles, has been acquired, of which 95 per cent has been acquired in fee simple, the balance by condemnation.

"The westerly or Buzzards Bay end of the canal is land-locked and required no special treatment. The easterly end, however, lies on the open shore of Cape Cod Bay, in order to protect which it was necessary to build two breakwaters, the longer of which has a length of 3,000 feet and extends from the shore outwardly to where the water is 35 feet deep at mean low tide. Four hundred thousand tons of granite have been placed in these breakwaters. The banks of the canal have been protected by riprap of granite stone, extending from a depth of 6 feet below mean low water to 6 feet above mean high water. In order that the canal could be widened with the minimum amount of disturbance to existing work, the canal was constructed, not in center of the right of way, but to one side of such center line, so that if the canal should be widened to a bottom of 200 feet, the center line of such canal would be coincident with the center line of the right of way, so that the riprapping on one side of the canal only would be disturbed.

"The construction of the canal involved the doing of much auxiliary work, in addition to the acquisition of the right of way and the building of the breakwaters above described. This additional work consisted of the relocation and rebuilding of the lines of the New York, New Haven & Hartford Railroad Co., which following the valley occupied in considerable part the location of the canal; the building of 4½ miles of highways on both sides of the canal, and the construction of three bridges across the canal, one for railroad purposes at Buzzards Bay and two for highway and trolley purposes one at Bourne and the other at Sagamore. These bridges are of the Bascule type, with a span of 160 feet in each case, giving a clear opening between the fenders of 141 feet. The foundations, constructed in one case in open caissons on piles and in the other two cases by closed caissons under compressed air, have been carried to such a depth that a canal of 35 feet or more in depth can be constructed without interfering with the bridges. The bridges are operated electrically, the sources of power being three, so as to provide against failure, in addition to which they can be opened by hand. For purposes of navigation, the canal is lighted by electric lights in pairs, at intervals of 500 feet, except in the approach channels, where the Government has established its own system of larger lights and at longer intervals.

"The depth and width of the canal as given above are sufficient to meet the ordinary commercial demands of traffic as they exist at present.

"PROPOSED ENLARGED CONSTRUCTION.

"A canal of the dimensions described above is sufficiently large to accommodate all the smaller vessels of the Navy (in fact, all vessels, except battleships and large cruisers), and since the canal has been in operation it has been used by the smaller vessels of the Navy in increasing numbers.

"To make the canal large enough to accommodate vessels of the greatest size it will be necessary to give an increased depth and probably an increased width. Such dimensions will, of course, be determined by those in responsible charge of the Navy; but taking in view improvements that are being made in other parts of the country, we have assumed (for purposes of estimate) that a depth of 35 feet at mean low water and a minimum width on the bottom of 200 feet would be sufficient to accommodate the ships, not only those now built, but such as we understand are in contemplation for the future. We desire to point out that this depth, with the rise of the tide, would give at high water a minimum depth of 40 feet at the Buzzards Bay end and 45 feet at the Cape Cod Bay end, and that the Suez Canal, which carries the naval and mercantile fleets of the world, has at present a depth of 33.44 feet and a bottom width of 147.5 feet, and that the Kiel Canal has a depth of 32 feet and a bottom width of 72 feet.

"The original construction of the canal contemplated the possibilities of just such enlargement. The railways, highways, and bridges have all been built to admit the canal to be thus widened without necessitating their reconstruction or other adjustment, and the right of way is of sufficient width to permit this widening without the acquisition of more land; and the canal itself, being built to one side of the center line of the right of way, will involve the loss of but one-half of the riprap protection.

"To widen such portions of the canal as now have a width of less than 200 feet, and to deepen the whole of the canal from its entrance at Wings Neck Light to deep water in Cape Cod Bay will involve the excavation and removal of about 14,000,000 cubic yards of material. West of Wings Neck Light the canal company has made no surveys and the Government charts are not in sufficient detail to permit close estimates to be made. An examination of the charts shows that between the entrance of the canal at Wings Neck Light and a shoal known as "Cleveland Ledge," off Mattapoisett, there are several places where the depth of Buzzards Bay is less than 35 feet. The removal of these shoal spots (the location of which is shown on the maps hereto attached) would involve the excavating of perhaps 1,000,000 more cubic yards. All of this material in the canal and in Buzzards Bay consists of sand, gravel, and bowlders. The experience in over two years of operating the canal has shown that this material is hard and dense, and in the banks is not affected to any great extent by the passing of vessels.

"We understand that petitions have been drawn up and sent to the Government by shipping and other interests, praying for the construction of a harbor in which the vessels who do not care to proceed through the canal, if held by stress of weather or otherwise, can have good anchorage. The principal portion of Buzzards Bay is so shallow that there is no place to anchor vessels outside of the canal itself or its approaches. We believe that such a harbor should be provided, and that the best place to construct it is in front of Monument Beach. To build an anchorage space

with a bottom width of 750 feet and a length of 4,500 feet, all to have a depth of say, 30 feet, will require the excavating of about 2,000,000 cubic yards.

"If the canal were widened and deepened a channel would be secured capable of carrying the largest vessels of the Navy and furnishing an interior waterway absolutely free from attack by hostile fleets, by which the United States vessels could be moved between the three deep-water naval bases of New York, Newport, and Boston, and thus bring Boston and the northern New England ports in close connection by such interior waterway with the ports to the westward, and to permit the concentration of our fleet as the exigencies of the service or the wishes of the department may indicate.

"FINANCIAL.

"The canal was opened for traffic drawing not exceeding 15 feet on July 31, 1914; some months further were required to deepen certain spots still remaining in the prism of the canal, but as this work progressed vessels of deeper draft were from time to time permitted through the canal.

"The business of the canal has increased as the facilities for vessels of varying class have been made available, until as of this date the earnings of the canal are at the rate of upward of $502,000 per annum. These earnings are based upon contracts that have been entered into between the canal company and certain large water transportation companies, and the regular established business being enjoyed by the canal and do not take into consideration any vessels not making regular use of the facilities offered. Negotiations are now under way looking to a material increase in these earnings, so that we feel it is not unfair to state that within a very short time an even more important statement of actual earnings than that herein set forth will be available.

"From the above figures it will be noted that the canal is now being operated upon a profitable basis. The operating costs of the canal are approximately $180,000 a year; interest on the outstanding bonds of the canal company amounts to $300,000 per annum, hence it will be seen that the receipts now being enjoyed by the company are in excess of all operating costs and fixed charges.

"We respectfully submit that viewed from a business standpoint, contemplation by the Government of a purchase of the canal may be based upon the acquisition of a property now capable of carrying the interest not only upon its first cost, but including any outlay necessary for the proposed deepening and widening, as above set forth.

"This statement is accompanied by (1) copy of the charter, (2) map of the canal, (3) United States Government chart showing the upper reaches of Buzzards Bay and the western approach to the canal, (4) schedule of existing rates of toll."

I submit also the following schedule of existing rates of toll of the Boston, Cape Cod & New York Canal Co.:

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

(Superseding all previous notices relative to toll rates for vessels of "Class A.")

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

Tolls for yachts, motor boats, and vessels not engaged in commercial trade.

	For single passage.[1]	Making a single passage through canal in squadrons of 10 or more vessels per single passage.[2]	Making a round trip through canal, returning within 10 days, per round trip.[3]
For vessels less than 16 gross tons based on length over all.			
Minimum less than 30 feet	$5	$4	$8
30 feet to 34 feet	6	5	10
35 feet to 39 feet	8	6	12
40 feet to 44 feet	10	7	14
45 feet to 49 feet	12	8	16
50 feet to 54 feet	14	9	18
55 feet to 59 feet	16	10	20
60 feet to 64 feet	18	12	24
65 feet and over and less than 16 gross tons	20	14	28
For vessels over 16 gross tons.			
16 to 19	21	16	32
20 to 24	23	18	36
25 to 29	25	20	40
30 to 34	27	22	44
35 to 39	29	24	48
40 to 44	31	26	52
For vessels over 16 gross tons—Con.			
45 to 49	$33	$28	$56
50 to 74	35	30	60
75 to 99	38	32	64
100 to 124	41	34	68
125 to 149	44	36	72
150 to 199	47	38	76
200 to 249	50	40	80
250 to 299	52	42	84
300 to 349	54	44	88
350 to 399	56	46	92
400 to 449	58	48	96
450 to 499	60	50	100
500 to 549	62	52	104
550 to 599	64	54	108
600 to 649	66	56	112
650 to 699	68	58	116
700 to 749	70	60	120
750 to 799	72	62	124
800 to 849	74	64	128
850 to 899	76	66	132
900 to 949	78	68	136
950 to 999	80	70	140

[1] For vessels over 1,000 gross tons 8 cents per gross ton per single passage.
[2] For vessels over 1,000 gross tons 7 cents per gross ton per single passage.
[3] For vessels over 1,000 gross tons 14 cents per gross ton per round trip.

Payment of tolls to be made when vessel enters canal.
Vessels not returning within 10 days can obtain refund or credit for return ticket, based on difference between single passage rates and round-trip passage rates.

BOSTON, CAPE COD & NEW YORK CANAL CO.

Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

(Superseding all previous notices relative to toll rates for vessels of "Class B.")

The following toll rates, subject at all times to change or cancellation without notice, and effective this date, are not for vessels which have to make a fixed schedule time between ports and which require immediate passage through the canal:

	Tolls for vessels engaged in commercial trade, per single passage.[1 2]	Tolls for tugs when having no tow, per single passage.
For vessels less than 16 gross tons based on length over all:		
Minimum less than 30 feet	$5.00	$3.00
30 feet to 34 feet	6.00	3.50
35 feet to 39 feet	8.00	4.00
40 feet to 44 feet	10.00	5.00
45 feet to 49 feet	12.00	6.00
50 feet to 54 feet	14.00	7.00
55 feet to 59 feet	16.00	7.50
60 feet to 64 feet	18.00	8.50
65 feet and over and less than 16 gross tons	20.00	10.50
For vessels over 16 gross tons:		
16 to 19	21.00	10.00
20 to 24	23.00	10.50
25 to 29	25.00	11.00
30 to 34	27.00	11.50
35 to 39	29.00	12.00
40 to 44	31.00	12.50
45 to 49	33.00	13.00
50 to 74	35.00	14.00
For vessels over 16 gross tons—Continued.		
75 to 99	$38.00	$15.00
100 to 124	41.00	16.00
125 to 149	44.00	17.00
150 to 199	47.00	18.00
200 to 249	50.00	19.00
250 to 299	52.00	20.00
300 to 349	54.00	21.00
350 to 399	56.00	22.00
400 to 449	58.00	23.00
450 to 499	60.00	24.00
500 to 549	62.00	.....
550 to 599	64.00	.....
600 to 649	66.00	.....
650 to 699	68.00	.....
700 to 749	70.00	.....
750 to 799	72.00	.....
800 to 849	74.00	.....
850 to 899	76.00	.....
900 to 949	78.00	.....
950 to 999	80.00	.....

[1] Includes passenger vessels and freight vessels carrying other than crude material.
[2] For vessels over 1,000 gross tons, 8 cents per gross ton per single passage.

The toll rates for pile drivers, drill boats, dredges, wrecking outfit, and commercial vessels not licensed to carry passengers or cargo are not included in the above tolls, as formerly. Owners of such vessels should apply to the superintendent for rates.

BOSTON, CAPE COD & NEW YORK CANAL CO.

Capt. E. R. GEER,
Superintendent, Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

[Superseding all previous notices relative to toll rates for vessels of Class C.]

On and after September 8, 1916, the separate schedule of toll rates, including towage for commercial schooners of 100 tons capacity or over, known as Class C1, dated November 5, 1915, will be canceled, and the following rates will be effective for all schooners and all other vessels engaged in carrying crude material.

On and after September 8, 1916, the Boston, Cape Cod & New York Canal Co. will not tow vessels through the canal.

A separate organization known as the Cape Towing Corporation has arranged to provide tugs for towing through the canal. All vessels requiring the services of a tug should, from and after September 8, 1916, make their own arrangements with the Cape Towing Corporation or any other towing company.

The towing charge will be in addition to the tolls to be charged by this company.

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

	Tolls for—			Tolls for—	
	Vessels carrying crude material in bulk cargo lots, and fishing vessels; for a vessel with cargo per single passage.[1]	Vessels having no cargo, but empty or in ballast, per single passage.[2]		Vessels carrying crude material in bulk cargo lots, and fishing vessels; for a vessel with cargo per single passage.[1]	Vessels having no cargo, but empty or in ballast, per single passage.[2]
For vessels less than 16 gross tons based on length over all:			For vessels over 16 gross tons:		
Minimum less than 30 feet	$4.00	$3.00	16 to 24	12.00	9.00
30 feet to 39 feet	5.00	4.00	25 to 34	14.00	9.50
40 feet to 44 feet	7.00	5.00	35 to 49	18.00	10.00
45 feet to 49 feet	8.00	6.00	50 to 74	21.00	10.50
50 feet to 59 feet	9.00	8.00	75 to 99	24.00	11.00
60 feet and over and less than 16 gross tons	12.00	9.00	100 to 124	27.00	11.50
			125 to 149	30.00	12.00
			150 to 199	33.00	12.50
			200 to 299	37.00	13.00
			300 to 399	39.00	14.00
			400 to 499	40.00	15.00

[1] Vessels over 500 gross tons will be charged on the basis of their having on board 800 tons of cargo at 5 cents per cargo ton per single passage. Vessels having on board over 800 cargo tons, 5 cents per cargo ton single passage.

[2] Vessels over 500 gross tons without cargo, 3 cents per gross ton per single passage.

The total tonnage of cargo in vessels in tow is to be computed as if on board a single vessel. Tolls include the towing tug provided by the owners of barges or schooners. Vessels carrying cargo by measurement must reduce it to tons. For information regarding contract rates, etc., apply to

BOSTON, CAPE COD & NEW YORK CANAL CO.

Capt. E. R. GEER, *Superintendent,*
Buzzards Bay, Mass.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
New York, September 8, 1916.

CAPE COD CANAL—SPECIAL NOTICE.

[Superseding all previous notices relative to toll rates for Government vessels.]

The following toll rates, subject at all times to change or cancellation without notice, are effective this date:

Class "D" tolls for Government vessels shown in Government books under gross tonnage, and as entered in ship's data book for displacement normal.

FOR VESSELS LESS THAN 16 GROSS OR DISPLACEMENT TONS BASED ON LENGTH OVER ALL.

Minimum less than 30 feet	$8	50 to 54 feet	$20
30 to 34 feet	10	55 to 59 feet	22
35 to 39 feet	12	60 to 64 feet	25
40 to 44 feet	15	65 feet and over and less than 16 gross or displacement tons	30
45 to 49 feet	17		

FOR VESSELS OVER 16 GROSS OR DISPLACEMENT TONS.

16 to 19 tons	$30	1,050 to 1,099 tons	$104
20 to 24 tons	31	1,100 to 1,149 tons	106
25 to 29 tons	32	1,150 to 1,199 tons	108
30 to 34 tons	33	1,200 to 1,249 tons	110
35 to 39 tons	35	1,250 to 1,299 tons	112
40 to 44 tons	37	1,300 to 1,349 tons	114
45 to 49 tons	40	1,300 to 1,349 tons	114
50 to 74 tons	45	1,400 to 1,449 tons	118
75 to 99 tons	50	1,450 to 1,499 tons	120
100 to 124 tons	55	1,500 to 1,599 tons	124
125 to 149 tons	60	1,600 to 1,699 tons	128
150 to 199 tons	65	1,700 to 1,799 tons	136
200 to 249 tons	70	1,800 to 1,899 tons	144
250 to 299 tons	72	1,900 to 1,999 tons	152
300 to 349 tons	74	2,000 to 2,099 tons	160
350 to 399 tons	76	2,100 to 2,199 tons	168
400 to 449 tons	78	2,200 to 2,299 tons	176
450 to 499 tons	80	2,300 to 2,399 tons	184
500 to 549 tons	82	2,400 to 2,499 tons	192
550 to 599 tons	84	2,500 to 2,999 tons	200
600 to 649 tons	86	3,000 to 3,999 tons	240
650 to 699 tons	88	4,000 to 4,999 tons	300
700 to 749 tons	90	5,000 to 5,999 tons	360
750 to 799 tons	92	6,000 to 6,999 tons	420
800 to 849 tons	94	7,000 to 7,999 tons	480
850 to 899 tons	96	8,000 to 8,999 tons	540
900 to 949 tons	98	9,000 to 9,999 tons	600
950 to 999 tons	100	10,000 tons and over	
1,000 to 1,049 tons	102	6 cents per gross or displacement ton.	

Fuel and supply vessels over 1,000 gross or displacement tons when empty or in ballast, 5 cents per gross or displacement ton per single passage.

BOSTON, CAPE COD & NEW YORK CANAL CO.

Capt. E. R. GEER, *Superintendent*,
Buzzards Bay, Mass.

At the forty-fifth annual meeting of the National Board of Steam Navigation, held at Washington, D. C., December 6, 1916, the following resolutions were adopted:

CAPE COD CANAL.

The following resolution was presented by Mr. C. R. Stewart. Its adoption was seconded by Mr. Fred B. Dalzell and carried:

"Whereas, the Cape Cod Canal is navigable for all classes of vessels that do not draw over 25 feet of water, and necessary and profitable for all shipping in the saving of time and money and in added security, and

"Whereas, it may be conceded that the tolls now charged are as low as the excellent facilities afforded by the canal at any and all seasons of the year may seem to justify, and

"Whereas, the tolls, at the present low ebb of maritime shipping, are a serious burden, discouraging owners of shipping in using the safer route of the canal against the dangerous rounding of Cape Cod, and

"Whereas, it is believed that the best interests of shipping would be served by having this canal made a free waterway under the control of the United States Government, at the present time there being a division of authority and alike a division of responsibility, inasmuch as the Joint Board of Harbor and Land Public Service Commissions of Massachusetts exercises a certain function of authority over the shipping through the canal, sharing a divided responsibility with the War Department in regard to some portions, if not all of the waterway,

"*Resolved*, That the National Board of Steam Navigation petition the War Department and Congress to take the necessary steps to have the United States Government acquire ownership of the Cape Cod Canal, making it a free waterway for the benefit of shipping along the Atlantic Coast."

Referring to the military value of the canal, I wish to submit a statement made before the Committee on Military Affairs of the Senate, January 24, 1916, by Maj.

Gen. Arthur Murray, formerly the Chief of Coast Artillery, and now on the retired list of the Army. In reply to a question by Senator du Pont, relating to a scheme of national defense, Gen. Murray said:

"I should say without any question it should be, and while on that subject I would call attention to another canal which I consider of great importance in such a scheme of defense. That is the canal, already built, known as the Cape Cod Canal, leading from New Bedford in Cape Cod Bay. A short canal, which would enable submarines in Boston Harbor to be passed through it to join in with those in New York Harbor or vice versa. For this reason I consider this canal of such importance that, in my judgment, it should be fortified as soon as possible."

Referring to the military defense of this locality, I submit a letter from Col. Henry F. Hodges to Col. R. P. Davis, of the Coast Artillery Corps, which gives, I think, the accepted Army view of the coast defenses of this region:

HEADQUARTERS NORTH ATLANTIC COAST ARTILLERY DISTRICT,
Fort Totten, N. Y., February 10, 1916.

MY DEAR DAVIS: On my return from leave of absence I found your letter of the 22d ultimo stating that Gen. Murray was interested in knowing my views as to the defense of the Cape Cod Canal.

I believe that the Buzzard's Bay Canal, even in its present condition, is of strategic value. If deepened, as it undoubtedly will be, it will be of the greatest possible importance. Buzzards Bay itself is a gateway leading directly into the most vital section of the country. It is a most inviting landing place for a hostile expedition. Further, the anchorage in the bay and the waters in the neighborhood of Vineyard Sound will undoubtedly, if available, be used to advantage by an enemy's fleet. I have therefore favored a strong new armament, to be disposed, not simply for the protection of New Bedford but to cover effectively the entire waters of the bay.

I favor an additional armament approximately as follows: Three 16-inch guns, six 6-inch guns, eight 16-inch mortars, and an adequate number, say, four or more, of 3-inch guns, and believe that this entire new armament might well be placed on West Island. It should be supplemented by some movable guns placed near the head of the bay, say, on Great Neck, to prevent small craft from raiding the southern end of the canal. The big guns should be mounted on carriages permitting high angles of elevation.

I should by no means object to a stronger armament if funds can be made available.

As to the defense of the eastern entrance of the canal, that may for the present be left to movable artillery anywhere along the banks. When operations for deepening the canal have advanced sufficiently to make it available for large vessels it may be necesssary to emplace permanent batteries near the entrance to insure the use of the canal by our own ships, but I believe this unnecessary at the present time, though the probable future necessity should be kept in view.

I am in some doubt whether you desired me to write you or to Gen. Murray directly, but think it best to send this to you and to make no attempt to go beyond a general statement of my views.

Very sincerely, yours,

H. F. HODGES.

Col. R. P. DAVIS, *Coast Artillery Corps,*
Office Chief of Staff, Washington, D. C.

Gen. Leonard Wood, while in command of the Division of the East, wrote Gen. Murray a letter, which I include in the record, because it furnishes additional testimony as to the Army view of the strategic value of this canal.

HEADQUARTERS EASTERN DEPARTMENT,
Governors Island, N. Y., February 26, 1916.

DEAR GENERAL: Thank you for your letter.

First. I believe that there should be submarines of small type operated under officers of the Navy attached to our harbor defenses.

Second. I believe in the strategic advantages of the intercoastal waterway, especially the deepening of the Cape Cod Canal, so that it can be used by the largest battleships. This will make the sea area from Boston to lower New York Bay one continuous fortified area that would be of great value in case we are opposed by a dominating naval force.

Third. The strategic value of the Chesapeake & Delaware Canal will be great, as outlined in your letter.

We have already recommended the fortification of Buzzards Bay and the installation of much heavier batteries.

I want to talk this entire matter over with you when next I come to Washington.

Push the Cape Cod Canal project as hard as you can. It is very important to our coast defense.

Yours, sincerely,

LEONARD WOOD.

Maj. Gen. ARTHUR MURRAY,
War Department, Washington, D. C.

I submit also extracts from a letter from Maj. Gen. Arthur Murray to Gen. Leonard Wood, dated February 18, 1916, as follows:

"In direct connection with this question of the use of submarines as adjuncts to our coast defenses is another matter affecting such on the Atlantic coast which has been brought specially to my notice since I wrote the memorandum for Mr. Clark. This is the importance of the intracoastal waterway of the Atlantic coast, which lies in your bailiwick and in which Mr. J. Hampton Moore and Senator Saulsbury are especially interested. It seems to me that there can be no question in the mind of any military expert who has given consideration to the subject, but that any canals of that waterway of sufficient width and depth to permit the passage of submarines, running at the surface through them, would add enormously to the defensive strength of the Atlantic coast line; and as four of our largest and richest cities, Boston, New York, Philadelphia, and Baltimore, together with our Capital—the very vitals of the Nation—are on this proposed waterway, every possible effort should, in my opinion, be made to complete the proposed waterway as soon as possible. Especially that portion of it which would strengthen the defense of the cities named.

"In this portion is the canal connecting Chesapeake and Delaware Bays, which, if widened and deepened sufficiently to permit the passage of submarines, would allow any submarines assigned as adjuncts to the coast defenses of Chesapeake and Delaware Bays to be combined for the defense of Philadelphia, Baltimore, or Washington; and as under the naval rule the power of a fleet varies not with the number of its units, but with the square of the number of its units, the value of such possibility of combination for defense can readily be seen. Another and even more important canal in this portion of the proposed waterway is that connecting Cape Cod and Buzzards Bays. This canal is, as you know, already completed, and is of sufficient width and depth—about 100 feet wide and 25 feet deep at mean low water—to permit not only "K"-type submarines but destroyers and light-draft cruisers to pass through it. Both these canals and all others of the proposed waterway, if not located within coast-defense lines, should, in my opinion, be promptly fortified, and should also be owned, controlled, and operated by the Government.

"Senator Saulsbury, I understand, has lately introduced a bill in the Senate for the purchase by the Government of the Chesapeake & Delaware Canal, and its widening, deepening, and fortification, both for commercial and strategic purposes. As the Cape Cod Canal is already completed and ready for use by vessels of 25 feet or less draft, it seems to me that it is about time for some Massachusetts or New York Congressman to get busy and introduce a bill for its purchase by the Government and its fortification for defensive purposes. As to what would be the commercial return of these canals if owned and operated by the Government, I have no means of ascertaining, but I have no doubt but that they would pay for the cost of their operation and a fair rate of interest on their purchase price. The Chesapeake & Delaware Canal would only need defenses at Lewes, on the Delaware Bay side; the Cape Cod Canal should, it is thought, be defended by guns or mortars covering both its ends."

I desire included also an estimate of the requirements of the west end of the canal—that is, the Buzzards Bay end:

"Subject: Armament for defense of Cape Cod Canal.

"1. The western terminus of the Cape Cod Canal lies in Buzzards Bay. The plans of the War Department Board of Review call for the installation at Fort Rodman, New Bedford, of two 12-inch howitzers, mounted in fixed positions, for the purpose of denying Buzzards Bay to a naval enemy. The cost of emplacements and carriages for these howitzers—the howitzers themselves are on hand—will be $310,000. The cost of the accessories for this armament—that is, ammunition, fire control, searchlights, and power plants—will amount to $240,000 additional. It is contemplated that the fire of these 12-inch howitzers will be reinforced by the projected 14-inch movable armament, which would be mounted on railway trucks and will operate along the shores of the bay. The cost of each 14-inch howitzer, complete, with surplus railway trucks for ammunition and other accessories, is estimated at $190,000. The estimates submitted to Congress this year include an item for the construction of the two 12-inch howitzers at Fort Rodman, and also an item for the construction of one experimental 14-inch movable howitzer mounted on railway truck.

"2. No plans have been adopted as yet for the defense of the eastern terminus of the Cape Cod Canal. The provision of two 12-inch howitzers on fixed mounts would be sufficient, it is thought, for the defense of that terminus of the canal against naval attack if supplemented by the movable howitzers to be provided for the defense of Buzzards Bay. The cost of the 12-inch howitzers and their accessories would be the same as the cost given above for the same armament at Fort Rodman."

I also include a statement submitted to the headquarters of the Department of the East by Col. Black, now Chief of Engineers, relating to this subject:

HEADQUARTERS EASTERN DEPARTMENT,
OFFICE OF DEPARTMENT ENGINEER OFFICER,
New York, N. Y., January 31, 1916.

From: Department engineer.
To: The Chief of Engineers.
Subject: Cape Cod Ship Canal.

1. Attention is invited to the inclosed copies of letters of January 18 and 23 from Mr. William Barclay Parsons, chief engineer of the Boston, Cape Cod & New York Canal Co.

2. The views of the board charged with the duty of submitting a project on the Boston-Beaufort section of the intracoastal waterway, regarding the Cape Cod Canal, are contained in House Document No. 391, Sixty-second Congress, second session, pages 31 and 33 to 35.

3. The Cape Cod Canal is open to commerce, and has demonstrated its value, although not yet improved to its full depth. Detailed studies for the defense of our coast have shown the very great military value of the canal, and I am informed reliably that studies by the Navy have led to the same conclusion.

4. In my opinion, at some time it will be necessary for the United States to obtain this canal by purchase. In the meantime the canal is private property, but is a navigable waterway connecting navigable waters of the United States. As such, under the various decisions of the courts, I believe that the United States has full power to determine the conditions under which bridges can be placed across the canal. I believe further that the commercial as well as the military importance of the canal is such that this power should be exercised to its fullest extent.

5. Under these conditions the inclosed letters are forwarded for such action as the department may deem advisable.

6. It is requested that information be given me as to the views of the department regarding its right of control over the construction of bridges across this privately owned waterway.

W. M. BLACK,
Colonel, Corps of Engineers.

Rear Admiral Colby M. Chester, United States Navy, now on the retired list, but for many years considered one of the Navy's ablest and most scientific officers, in an article relating to the national importance of the Cape Cod Canal, said:

"STRATEGIC IMPORTANCE OF CAPE COD CANAL.

"Massachusetts Bay is a weak point in the defensive system of the United States. It is separated from the long stretch of coast of the Middle and South Atlantic States by a series of shoals and islands extending for a considerable distance into the ocean, dangerous of approach at all times, and particularly so during storms and fogs. During the Civil War it was necessary at times to send ships to this locality in order to protect the harbors along the New England coast from ravages by the corsairs of the Confederates, and also during the Spanish-American War squadrons of vessels were drawn away from more important service to meet the demands of Massachusetts people, who were frequently driven into panic fright by anticipated raids of the enemy's cruisers. As a rule, however, the Navy Department was compelled to refuse the requests for vessels to guard local interests, as the Navy was engaged in a struggle of vital importance to the Nation and could not be diverted from their purpose to protect minor interests, which would prove to be of little value if the cause of the country failed.

"The military weakness of the New England coast is made evident by the fact that practically all the efforts of the Army in the preparation of war problems on a large scale have been concentrated on the defense of this part of the country. The annual maneuvers of the years 1909 and 1912, the only ones in which the Army dissociated from the Navy has been engaged, have taken place around Boston. It was assumed in carrying out these campaigns that the fleet as the first line of the country's defense

had been destroyed or neutralized by an invading force and the Army was the only power left to protect the enormous interests centered around Boston and New York. The result in each case only went to show how necessary to the salvation of these interests was the sea power of the Nation.

"It is a well-recognized principle of naval strategy to-day that wherever situated the fleet must be kept together, but it will be difficult to avoid paying some attention to such requisitions for a naval force, and advantage should be taken of every natural feature of the coast line that will make it possible for the fleet to act as a unit and yet be brought to a threatened point in the shortest space of time.

"It is probable that either Narragansett Bay or Hampton Roads will be the future base of the fleet on the Atlantic coast in war times. The former has the merit of being near the center of the line to be covered in protecting, by a marine force, the great strategic points of Boston, New York, and the Delaware and Chesapeake Bays.

"The Panama Canal has for the main purpose of its existence the transfer of the fleet from one coast to the other, on an interior line 8,000 miles less than over the route an enemy would be compelled to take in any attempt to attack our ports. The Cape Cod Canal will shorten the distance between Newport and Boston nearly as much in proportion to the lengths of routes as will be gained for the western coast by the construction of the Panama Canal. No commander in chief of the fleet would ever attempt to pass through the tortuous and ever-shifting channels in Vineyard Sound even if there was water enough to float his ships, for it is likely that he would be delayed by fog, bad weather, and other causes in using this passage to such extent as might mean the difference between victory and defeat for the force he commanded. The only course left him, therefore, to pursue at present is to proceed around Nantucket South Shoal; and in taking this route, should the enemy precede him into Massachusetts Bay, he would be cut off from making a junction with Boston Harbor and its fortifications and leave his small vessels with no port to fall back upon in case they should be disabled.

"The deepening of the Cape Cod Canal sufficiently to permit the passage of battleships would obviate these objections, add greatly to the zone control of the fleet, and increase the value of the harbor defenses of Boston and New England ports as well. Secretary of War Garrison cites the attempt of the Army to solve the war problem of 1909, as shown by the military maneuvers around Boston, to show how defenseless are the fortifications of the city to prevent its capture by an invading force. This simply illustrates the doctrine propounded by Hon. J. C. Dobbin, Secretary of the Navy, of 1853, when he tersely put the matter thus:

"'Fortifications without a Navy have well been compared to a shield without a sword.'

"We have a conspicuous parallel to the importance of the Cape Cod Canal to New England interests in the Kiel Canal, which was built by the German Nation, at a cost of nearly $100,000,000, for practically strategic purposes, yet the reduction of the distance between the base of the German fleet in the Baltic and the North Sea by way of the canal is but little more than that which will be gained for the American fleet by the enlargement of the Cape Cod Canal between the two important strategic centers, Newport and Boston.

"If, then, the Government needs the Cape Cod Canal, as a factor in the problem of national defense; why should it not bear the expense for its construction? Boston, as one of the principal outlets for western commerce, has an interstate importance, aside from the large local interests of the New England States it represents, and the protection of this great emporium in time of war would be, therefore, for 'the general welfare of all the people of the country,' and the expenditure of money by the Nation to enlarge the Cape Cod Canal for the fleet is justifiable. In view of the fact that the construction of the Cape Cod Canal is a private enterprise, authorized by the State of Massachusetts, it is a problem to bring about its control by the National Government; but I have a suggestion to make in this connection, which will, I think, answer the purpose."

In 1884 Lieut. Tasker H. Bliss, United States Artillery, prepared a thesis on the subject of the strategical value of inland canal investigation, which at that time attracted a great deal of attention. In this very elaborate discussion on the subject he referred to the Cape Cod project in the following language. It is unnecessary to call attention to the fact that the Lieut. Bliss of 1884 is now the Acting Chief of Staff of the Army. He said:

"One or two cities become the great centers of wealth, refinement, and civilization; from their exchanges are directed the financial operations of the Nation, and at times those of the civilized world; while complicated systems of railways daily pour into their countless warehouses merchandise whose profitable disposal will enrich, whose loss will impoverish, thousands of men scattered through the remotest provinces of

our broad domain. A bold and skillful enemy, grasping in an iron hand these vital organs of national life with all their throbbing arteries, may paralyze for a long time all resistance, and though by a superhuman effort the grasp may be thrown off, it can only be done with a great expenditure of money, life, and national honor. It is to guard against such loss and humiliation that our most skillful engineers have been engaged for generations in devising a system of frontier defense that shall hold an enemy in check until the Nation has had time to put forth its strength, while their attention has been equally directed toward the channels by which this latent energy can be most speedily directed toward the point of danger. * * *

"Before considering in detail the various parts of the system, it will be convenient to describe briefly in this place the line of interior communications on which, in time of war, reliance must be placed as the substitute for the exterior coasting navigation.

"Beginning in the great bay to the north of Cape Cod it passes overland, either into Narragansett Roads or Buzzards Bay; thence through Long Island Sound to New York Harbor; thence by the Raritan River to New Brunswick, and by the Delaware & Raritan Canal to the Delaware River at Bordentown; down this river to Delaware City, and thence by the Delaware & Chesapeake Canal to the Chesapeake Bay; down the Chesapeake, up Hampton Roads and the Elizabeth River; thence by the Dismal Swamp Canal and the Albemarle & Chesapeake Canal to Albemarle Sound; thence through the swamps and landlocked sounds and lagoons of the Carolinas and Georgia to Florida; overland to the Gulf of Mexico; and thence through the interior sounds and bays to New Orleans.

* * * * * * *

"In 1870 Gen. Foster reported that a canal across Cape Cod from Barnstable to Buzzards Bay was perfectly practicable; that it was a necessity to navigation, and would be of great commercial value and of great military importance in time of foreign war.

"Investigations and surveys for this canal have been repeatedly made since 1623. Commencing with the early colonists of Plymouth, they have been carried on by private citizens, by the State, by an officer of Engineers under authority of Gen. Washington, by a board of internal improvements under authority of Congress, and finally by the State of Massachusetts under the advice of the commissioner of the United States for the Boston Harbor.

"This line was used in early colonial times in spite of the necessary portage to avoid the dangers of a trip around the cape, and during the War of 1812 the coasting trade from Boston south passed over the isthmus to avoid the enemy's cruisers.

"At present over 40,000 vessels annually pass the cape, most of them in the coasting trade. Their value with cargo is placed at $600,000,000 and the annual saving by the canal, allowing one-fourth of 1 per cent saved on insurance, is estimated at $1,041,666.67."

December 4, 1915, Rear Admiral Austin M. Knight, at that time the president of the Naval War College and one of the most accomplished officers of the Navy, submitted to the Secretary of the Navy a statement of the defense of Narragansett Bay and vicinity, which I shall include in the record:

UNITED STATES NAVAL STATION, NARRAGANSETT BAY,
Newport, R. I.

To: The Secretary of the Navy (operations).

Subject: Defense of Narragansett Bay and vicinity.

References: (*a*) Navy Department, confidential letter 27288–43:4 of March, 23, 1915; (*b*) letter of supervisor of second naval district, ND/39–NS/236, of September 10, 1915; (*c*) Navy Department, first 27288–43:14/Op.–12, of October 18, 1915.

Inclosures: (A) Copy reference (*a*), (B) copy reference (*b*), (C) copy reference (*c*).

1. As stated in reference (*b*), I consider that the defense of the Narragansett Bay Naval Station can not properly be dissociated from the larger question involved in the defense of the vitally important strategic area of which Narragansett Bay is the center. This area extends from Monomoy to Sandy Hook and includes Nantucket and Vineyard Sounds, Block Island Sound, Buzzards Bay, Narragansett Bay, and Long Island Sound.

2. This area should be considered as a whole and so treated in any scheme of devel opment and defense. It includes, grouped within narrow limits, a large number of available anchorage grounds, all of them conveniently accessible, perfectly sheltered, and capable of defense by mines and submarines as well as by batteries on shore.

3. In addition to the advantages immediately inherent in this area itself as a base for operations is the further fact that it lies directly on the flank of the line of advance

and the lines of communication of any force which may attempt to establish itself at New York or at either Delaware or Chesapeake Bay.

4. I think it is not too much to say that this area is the strategic center of defense for the North Atlantic coast and in a very lateral sense the strategic key to that defense. Its value could be enormously increased by the enlargement of the Cape Cod Canal to dimensions which would make it available for battleships, and still further by the development of a deep-water channel from Nantucket Sound to the eastward south of Great Round Shoal.

If it is practicable to develop a battleship channel through Hell Gate from Long Island Sound to New York Harbor, this would add still another route for entrance and exit, and it is unnecessary to dwell upon the strategic advantage which would result.

5. The same features which give to this area its unique value for defensive operations give it a similar value as a base for an attacking force and make its denial to such a force a matter of supreme importance. Taking the various approaches in succession, the following facts become at once apparent as defining the character of this defense:

(1) All channels at the eastern entrance to Nantucket Sound can be quickly and efficiently closed by removing aids to navigation and planting mines.

(2) The Cape Cod Canal can be quickly and effectively closed to navigation, whether it is or is not enlarged as above proposed. The seizure of the canal by an enemy force is a different matter, but the subject now under consideration is the denial of the strategic area south of the canal to the enemy's fleet. This could be accomplished without difficulty; not permanently, perhaps, but for a period during which, in all probability, the issue of the campaign would be decided.

(3) The defense of Hell Gate, considered as an approach to Long Island Sound, is a part of the defense of New York Harbor and need not be discussed here.

6. It appears from paragraph 5 that the principal task involved in the defense of what we may call the "southern New England strategic area" has to do with that part of this area centering in Narragansett Bay and terminating on the east at Gay Head and on the west at Montauk.

7. The various means of defense to be considered, leaving the main fleet out of consideration, are: (*a*) Mines, (*b*) submarines, (*c*) land fortifications, (*d*) air craft, (*e*) antiaircraft guns.

8. *Mines.*—Practically the whole of this area lends itself in an ideal way to defense by mines. A large number of these should be kept on hand at all times, with suitable vessels for laying them.

For mine laying there should be permanently stationed within this strategic area one mine-laying ship, Navy; one mine-laying ship, Army; one mine-laying ship (buoy tender), Lighthouse Service, controlled by Navy.

The records of the second naval district contain full particulars of tugs and other craft suitable for mine laying and likely to be available.

It is assumed that the Army will plant mines in channels and harbors and that the Navy will plant them in off-shore waters.

9. *Submarines.*—At least 35 submarines should be assigned to this region. In case of necessity some of these could pass through the Cape Cod Canal or through Long Island Sound and Hell Gate to take part in the defense of the northern New England area or that of New York. They should base for repairs and upkeep on Narragansett Bay, but their most convenient rendezvous would be in Great Salt Pond, Block Island.

10. *Land fortifications.*—Considering the subject primarily from the naval point of view these fortifications should be adequate for the following purposes:

(1) To prevent the bombardment from seaward of (*a*) the naval torpedo station on Goat Island, Narragansett Bay; (*b*) the naval fuel station at Melville, Narragansett Bay; (*c*) the available anchorages of the fleet in various parts of the strategic area under consideration (Long Island Sound, Narragansett Bay, Buzzards Bay, Nantucket and Vineyard Sound). They should also serve the following purposes: (*d*) Prevent attack by land upon the torpedo station, the fuel station, or the fleet at anchor; (*e*) protect all parts of the strategic area from attack by aircraft; (*f*) as far as practicable guarantee to the fleet a secure passage from one anchorage to another within the strategic area; (*g*) protect the mine fields.

The practicable range of the heaviest guns as mounted on shipboard may be put approximately at 22,000 yards, corresponding to an angle of elevation of 15°.

It is not impossible that this elevation will be increased in later ships, with a corresponding increase in range. It seems desirable to provide defense against guns on shipboard with a range of 30,000 yards, and this can, of course, be met only by guns having a range sufficient to command a distance greater than 30,000 yards from the point to be defended.

11. While it is believed that, as already stated, the Cape Cod Canal could be denied to an enemy's fleet so far as passage through it is concerned, there can be no question

that, if it is enlarged, the northern entrance to it should be held by efficient fortifications to avoid the necessity of blocking the canal and to admit of our own fleet passing through and deploying in the waters of Massachusetts Bay. For this reason the area about the northern entrance of the (enlarged) canal may be regarded as a part of what has been called the "southern New England strategic area."

12. As regards (*d*) and (*e*) under "land fortifications," in paragraph 10 above, attention is invited to the ease with which all parts of the strategic area which is under consideration can be attacked by land forces or aircraft from the waters of Massachusetts Bay. From Plymouth to Buzzards Bay the distance is only 17 miles and to Narragansett Bay only 35 miles. It is not considered necessary here to do more than indicate the demand for local defense against attack from this quarter. A study of the topographical features of the area involved indicates that a very strong defense could be made by a comparatively small mobile force. The roads in this vicinity are in the main excellent and lend themselves well to the transportation of troops and material by motor vehicles.

13. *Aircraft.*—It is believed that the best defense against aircraft is to be found in opposing them with aircraft.

For the defense of the area now under consideration it is thought that not less than 30 aircraft would be needed, with about the same number in addition for scouting to seaward, these last to be of the latest and most powerful type, with long radius of action and fitted with efficient radio apparatus. The aircraft scouts should base on Narragansett Bay, with hangars either on Coasters Harbor Island or on the Melville Reservation, or on both. But outlying stations should be established at Provincetown, Chatham, Nantucket, Marthas Vineyard, Block Island, and Montauk.

As supervisor of the second naval district, I have already begun the preparation of a list of aircraft and air pilots in this vicinity.

14. *Antiaircraft guns.*—A large number of these should be installed at rather widely separated points, some in immediate connection with the principal land defenses, some at carefully selected points forming a line well advanced from the localities for which defense from bombs is especially needed, and some in the immediate vicinity of these localities.

Those in the immediate vicinity of naval shops, magazines, storehouses, etc., should be controlled by the Navy, the others by the Army.

It would not be possible at present to specify desirable localities for outlying batteries of these guns, even if this phase of the matter came properly within the scope of this paper, but attention may be called to the importance of advancing some of them to the north and east toward Massachusetts Bay.

15. The local defense of naval material from aircraft calls for batteries on Goat Island, Coasters Harbor Island, and the Melville Reservation. It is recommended that four guns of the most approved aircraft type be mounted at each of these stations, that for Melville being placed on the high land immediately to the eastward of the station proper.

It is not believed that any protection in the way of bomb proofs or armored roofs would be of value for the magazines or fuel tanks, but it might be well to plant trees and climbing vines around them to make them as inconspicuous as possible. An effort will be made to do this.

The torpedo station is very conspicuous and, with its valuable store of torpedoes, would be among the first points selected for attack. It is recommended that a number of barges be prepared to receive the torpedoes which will be in storage here, and that when danger of attack is known to be imminent these barges be towed to some point in the bay where they will be out of reach of guns from ships lying outside the bay and as inconspicuous as they can be made to an observer looking down from an airship.

16. The duty of deciding upon and providing land defenses rests, of course, with the War Department, and in obedience to the authority of reference (*c*), I have consulted with Maj. Gen. Wood, commanding the Eastern Department, and have furnished him a copy of this letter. I have attempted nothing more in this paper than to indicate the extent and, in a very general way, the character of the defense required for protection of the naval interests involved. It would be a serious mistake and one involving possibilities of disaster to think of these interests as confined to the material—industrial plant, torpedoes, magazines, and fuel plant—which are concentrated here. The strategic interests of the fleet are of far greater significance, and, as I have stated in the early paragraphs of this paper, appear to me of altogether commanding importance.

17. As the matter of improved coast defense is under consideration by the War Department, and as it is expected that this matter will be taken up by Congress at the coming session, I recommend that this letter be referred to the general board for an expression of opinion, and that, if the general board and the department agree with the views herein expressed, the letter, with indorsements expressing approval, be forwarded to the War Department for consideration.

18. In conclusion, I desire to emphasize the fact that the most important point included in this letter is the recommendation that the Cape Cod Canal be developed into a channel for the passage of dreadnaughts. I know of no other simple step which would add so much to the efficiency of our coast defenses or so greatly increase the availability of our fleet for operations, whether of defense or offense (in our own waters).

AUSTIN M. KNIGHT,
Rear Admiral.

In referring to this report Admiral Knight stated, on another occasion, a little more definitely his approval of the project of enlarging and making still more important the Cape Cod Canal, as follows:

"I can perhaps best give you my views on the subject of the Cape Cod Canal by sending a copy of a letter which I addressed to the Navy Department some time ago, calling attention to what seemed to me the remarkable strategic features connected with the coast from Sandy Hook to Cape Cod, and from there northward.

"You will see that I place great stress upon the enlargement of the Cape Cod Canal as a strategic proposition in the interest of the Navy. * * *

"So far as submarines are concerned, you understand, of course, that the canal is now perfectly available. Not only submarines, but destroyers, have passed through many times. I maintain that this is only a small part of the sphere of usefulness which should be served by the canal. It should, in my opinion, afford a passage for the battleship fleet from a position south of Cape Cod to one north, or the converse. It should also serve, as you suggest, for the passage of a disabled battleship from one area to the other."

I submit the following resolutions, which explain themselves:

"At a meeting of the Massachusetts Real Estate Exchange, May 3, 1917, the following resolutions were adopted:

"*Resolved*, That the Massachusetts Real Estate Exchange favors the immediate acquisition and operation of the Cape Cod Canal by the United States Government:

"First. For military and strategic reasons;

"Second. In the interest of lower prices for the commodities and necessities of life which are bound to result to the consumers and business men of Massachusetts and New England from free tolls;

Third. Because a great waterway of this character, so important to our business and economic needs, should not be in the control of private individuals, but should be owned and operated by the United States Government; and

"We therefore urge our Senators and Representatives in Congress to use their best endeavor to secure immediate Government ownership."

It is very difficult to obtain an accurate statement of the wrecks and casualties on and near Cape Cod in recent years, but I submit some figures which indicate both the loss of life and the loss of property and the delays which navigation is put to in using this coastwise route. These figures are taken from the record of the United States Life-Saving Service.

Statement of wrecks and casualties on and near Cape Cod, Mass.

[From the records of the United States Life-Saving Service from July 1, 1875, to May, 1903—about 28 years.]

Dates.	Number of vessels.	Property involved.	Property lost.	Lives lost.	Vessels lost.
July 1, 1875, to June 30, 1895	473	$6,111,920	$1,615,245	63	137
July 1, 1895, to Dec. 31, 1898	102	2,468,960	267,870	27	28
Jan. 1, 1899, to Dec. 3, 1899	29	412,965	34,925	.....	6
Jan. 1, 1900, to May, 1903	83	1,111,505	261,575	15	26
Grand total	687	10,105,350	2,179,615	105	197

Places where vessels have stranded, years 1904 to 1913, inclusive.

	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	Total.
Cape Cod	11	16	6	19	15	10	10	10	10	8	115
Cape Cod Bay	9	3	1	1	9	7	4	1	1	3	39
Marthas Vineyard	2	6	7	7	2	3	7	6	1	1	42
Nantucket	3	6	.....	.....	5	1	5	2	3	3	28
Nantucket Sound	3	9	4	6	8	5	8	1	7	2	53
Nantucket Shoals	.....	.....	.....	1	.....	.....	1	2	.....	1	5
Vineyard Sound	2	4	4	4	7	7	4	5	8	2	47
Total	30	44	22	38	46	33	39	27	30	20	329

Casualties within scope of life-saving stations year 1913–14.

	Number of vessels.	Gross tonnage.	Estimated value of—			Property lost.	Persons on board.	Persons lost.
			Vessel.	Cargo.	Vessel and cargo.			
Documented vessels	35	9,354	$379,400	$126,765	$506,165	$18,510	243	.....
Undocumented vessels	23	.....	21,730	.....	.....	945	46	.....
Foundered	1	1,295	.....	.....	.....	.....	5	2
Total, 1913	59	10,649	401,130	126,765	506,165	19,455	294	2
YEAR 1914.								
Documented vessels	49	18,083	645,300	113,880	759,180	171,465	377	6
Undocumented vessels	36	.....	15,695	.....	.....	520	56	.....
Foundered	1	410	.....	.....	.....	.....	6	1
Stranded	1	133	.....	.....	.....	.....	14	5
Total, 1914	87	18,626	660,995	113,880	759,180	171,985	453	12
Total for 1913–14	146	29,275	1,062,125	240,645	1,265,345	191,440	747	14

Relating to the savings that would be made by passing through the canal instead of around the cape I submit the following carefully prepared estimates:

Tug with tow of three barges.

Average cost per day of tug and three barges, including wages, fuel, subsistence, etc., is about $190.

Tug with three loaded barges eastbound saves by using the canal about 12 hours, or.	$95
Tug with three light barges westbound saves by using the canal about 10 hours, or.	75
Total saving per round trip	170

The above only shows the saving in time and does not take into consideration the delays on account of fog, weather, etc., amounting to from one day to a week in Vineyard Sound.

At Pollock Rip there are about 1,082 hours of fog per annum.

At the eastern entrance of the canal 564 hours of fog per annum.

At the western entrance of the canal 277 hours of fog per annum.

LARGE OIL-BURNING PASSENGER STEAMER.

The principal saving is in fuel oil, amounting to about $420 for the round trip.

These vessels save about 2½ hours per single trip by using canal.

The same remarks above as to weather, etc., apply to these vessels.

The average schooner costs about $30 per day for wages, subsistence, etc., and these vessels save from 1 to 7 days by using the canal.

I submit the following financial memorandum:

Memorandum of canal company securities to be issued for work done under contract for construction of Cape Cod Canal.

SECURITIES APPROVED FOR ISSUE BY JOINT BOARD.

	Bonds.	Stock.
Requisitions Nos. 1 to 19	$5,390,000	$5,382,000
10 per cent retained by canal company	539,000	538,200
Delivered to construction company	4,851,000	4,843,800

Memorandum of canal company securities to be issued for work done under contract for construction of Cape Cod canal—Continued.

REQUISITIONS NOW BEFORE THE JOINT BOARD FOR APPROVAL.

For quarter ending—	Date filed with board.	Bonds.	Stock.
January 1, 1915	Jan. 22, 1915	$490,000	$488,000
Completion of work	May 8, 1915	120,000	120,000
Due to construction company		610,000	608,000

TOTAL SECURITIES DUE TO CAPE COD CONSTRUCTION CO.

	Bonds.	Stock.
Securities retained on requisitions Nos. 1 to 19	$539,000	$538,200
Requisitions awaiting approval	610,000	608,000
Total	1,149,000	1,146,200

I submit also a statement of the operating costs of the canal, taken from the records of the company:

Boston, Cape Cod & New York Canal Co.—summarized statement of operating costs.

CLASSIFICATION.	Per annum.	CLASSIFICATION.	Per annum.
General administration	$83,500	Repairs and supplies (bridges and launches)	$8,750
Local administration and direct operating force	40,540	Insurance: Employees' compensation, fire and marine and accident, bridges and general liability	7,500
Miscellaneous labor at cape	12,000	Operation of railroad bridge	4,200
Tug service	30,000	Total operating costs	196,790
Electric light and power, and gasoline for launches	10,300		

The CHAIRMAN. I believe that concludes the hearing, so the committee will now adjourn.

(Thereupon the committee adjourned subject to the call of the chairman.)

Question No. 11: The extent to which additional aids to navigation, lights, buoys, if any, would be required in excess of the present equipment if the canal were purchased and operated by the Government.

Answer: The canal is to-day effectively lighted by fixed white incandescent lights placed opposite one another every 500 feet apart.

The following aids to navigation, now maintained by the Canal Co., would be required to be operated by the Government. (See Exhibit J.)[1]

Two range lights at the eastern end.

Fifteen fixed white or red lights on either a three-pile or single-pile dolphin.

The spar and gas buoys maintained by the Government are shown on the white print in this exhibit in black.

The bridges are amply protected by lights.

If the canal is deepened and widened it will not be necessary to maintain all of the 127 dolphins of 10 piles each, except those for mooring purposes at the eastern and western ends of canal and the approaches to the bridges. This will result in a material reduction in maintenance costs.

The following is quoted from a letter from the Commissioner, Bureau of Lighthouses, Department of Commerce, relative to proper lighting for the Cape Cod Canal, Mass.:

"I beg to state that, in the opinion of this office, a system of 48 electric lights (24 on each side of the canal), placed on 15-foot galvanized steel towers, would answer the requirements of navigation in the canal. The lights should be located about 2,000 feet part, apparatus to be 40-watt lamps in post lanterns, with 8-inch pressed-glass

[1] Not printed.

lens, the lights on the starboard hand to be red, those on the port hand white, entering the canal from the Buzzards Bay end.

"In view of the fact that the present pole line along the canal is more of a temporary than of a permanent nature, it would appear to be necessary to install new lines on both sides of the canal for its entire length, and it is estimated that the cost of erecting these pole lines and installing the 48 lights referred to, would cost approximately $40,000, while the annual maintenance of the system would be approximately $3,000."

Question No. 12: The difference in conditions which exist, if any, between the Cape Cod Canal and the Suez Canal to determine whether the experience of the latter throws light upon the maintenance and operation of the former, and if so, how and to what extent. Included in this is the determination of the geologic structures through which the Cape Cod Canal passes, their susceptibility to change due to erosion, currents, and other natural forces, and the nature and cost of maintenance of improvements necessary to insure permanency of present or future project dimensions.

Answer: W. J. Douglas, M. Am. Soc. C. E., and one of the leading authorities in this country on canals and their construction, states:

"The Suez Canal proper is 104 miles long and the Cape Cod Canal proper is 8 miles long. The former has a bottom width of from 108 to 118 feet and the latter, in the canal proper, a bottom width of 100 feet. The corresponding depths are 31.1 and 25.

"The Suez Canal, on account of its great length, has 23 passing places, and the Cape Cod Canal has passing places only in the widened portion of the canal at either end.

"The maximum current in the Suez Canal is 3 miles per hour and the comparable velocity is about the same in the Cape Cod Canal. It is impossible to accurately state these relative velocities because of the lack of truly comparable data.

"The Cape Cod Canal was excavated through a glacial moraine consisting of coarse sand, gravel, cobbles, and bowlders. The Suez Canal is largely excavated through fine sand except through a portion of its length which is in very soft limestone. Without having personally examined the Suez Canal but upon printed records, I am strongly of the opinion that the tendency toward erosion is very much greater in the Suez Canal than in the Cape Cod Canal.

"The cost of maintaining the slopes or banks of the Cape Cod Canal will be very small, almost negligible, after a few years of operation. The present banks, from 6 feet below mean low water and 6 feet above mean high water are rip-rapped where the material of the slopes is sand or sand containing only a small portion of gravel. This protection, as a matter of fact, is needed only during the first four or five years of operation. We find from observation of this canal and other waterways that the current takes out the finer particles and eventually leaves the sides and bottom with the coarser, so that the erosion of the Cape Cod Canal will decrease from year to year. At the Suez Canal this does not appear to be the case since the material almost throughout is of fine sand.

"The Suez Canal has been in almost constant process of widening and deepening since its construction and it is therefore quite impossible to get comparative figures, in dollars and cents, on its maintenance.

"It is interesting to note that when the Suez Canal was planned a great many eminent engineers thought that it would silt up entirely, the possibility of its silting up being very much greater than the Cape Cod Canal.

"For the next two or three years, or for possibly five years, after the canal is widened and deepened, the maintenance cost will be a factor in the operating cost due to the current carrying the finer sand from the narrower sections of the canal and depositing it in the wider. After four or five years of operation this shifting of sand should be negligible. At no time should the maintenance cost due to this be excessive."

Taking, as a basis for calculation, the cost of maintaining the canal prism to its minimum depth of 25 feet for the period between April 10, 1916, and August 31, 1917, the average yearly cost would approximate * * * $40,000. As time goes on, and the loose material in the canal prism finds permanent rest, the annual maintenance cost should be materially reduced from these figures. Experience in similar maintenance work would seem to fully justify this conclusion.

Question 13. The meteorological conditions, including the prevalence of storms, their effect upon shipping in passing through the canal or waiting for an opportunity to do so. This should be stated comparatively with the area of waters east and south of Cape Cod to determine relative conditions and should also have particular reference to the possible need of a harbor of refuge near the north end of the Cape Cod Canal.

Answer. This question has been answered quite specifically under paragraphs Nos. 5 and 6 and Exhibits A, D, and E and attached thereto. There is attached and marked "Exhibit K" the tidal currents average strength flood and ebb at points in Cape Cod Bay, off Cape Cod, Nantucket Sound, Marthas Vineyard, and Vineyard Sound. This data is copied from Eldridge's Tide Book.

The canal route affords sheltered water all the way up Buzzards Bay, making navigation possible in storms when the outside route is prohibitive, and it will be seen from the fog statistics mentioned under paragraph 5 and Exhibit A that there is at Pollock Rip light vessel 126 per cent more fog than at Wings Neck, 185 per cent more than at Bird Island, and 63 per cent more than at Plymouth (Gurnet lightship).

From observations taken at the canal it frequently happens that fog or snow is encountered east and south of Cape Cod from Race Point to Bobska Point, when at the same time the sun is shining and the weather clear over the canal route.

The prevalence of fogs and snow on the route around the cape is probably due to the currents bringing water of different temperatures into the vicinity, which have a pronounced effect upon the atmosphere.

Referring to a harbor of refuge, the eastern end of the canal is protected by a 3,000-foot breakwater, which is ample protection against northeast winds. The lee of the breakwater and the wide eastern entrance of the canal affords a harbor for the fishing fleet. See, as Exhibit L, letters from fishermen testifying to the benefit and advantage of the canal as a harbor of refuge.

Also see, as Exhibit M, copy of a petition signed by the masters, mates, and pilots of American vessels requesting that the appropriation for the construction and maintenance of a channel across Handkerchief Shoals, (to replace the old slue channel), Pollock Rip, be applied to additional breakwaters, light vessels, and deep-water shelter in Cape Cod Bay, and other aids to navigation, thereby insuring a permanent reliable and at all times practical route along the Massachusetts coast.

Exhibit K.

TIDAL CURRENTS—AVERAGE STRENGTH, FLOOD, AND EBB AT POINTS CAPE COD BAY, OFF CAPE COD, NANTUCKET SOUND, MARTHAS VINEYARD, VINEYARD SOUND.

[Copied from Eldridge's Tide Book.]

Cape Cod Bay (flood current: Average strength 1½ knots per hour).—The flood current begins to run northwesterly into Cape Cod Bay, Race Point bearing SSW., distance 3 miles, 10 minutes before it is low water at Vineyard Haven.

Cape Cod Bay (ebb current: Average strength, 1½ knots per hour).—The ebb current begins to run southeasterly out of Cape Cod Bay, Race Point bearing SSW., distance 3 miles, 10 minutes before it is high water at Vineyard Haven.

Off Chatham (flood current: Average strength, 1½ knots per hour).—The flood current begins to run northeasterly off Chatham (in the usual track of vessels) five hours before it is low water at Vineyard Haven.

Off Chatham (ebb current: Average strength, 1½ knots per hour).—The ebb current begins to run southwesterly off Chatham (in the usual track of vessels) five hours before it is high water at Vineyard Haven.

Pollock Rip Lightship (flood current: Average strength, 1½ knots per hour).—The flood current begins to run easterly at Pollock Rip Lightship two hours before it is low water at Vineyard Haven.

Pollock Rip Lightship (ebb current: Average strength, 1½ knots per hour).—The ebb current begins to run westerly two hours before it is high water at Vineyard Haven.

Great Round Shoal Lightship (flood current: Average strength, 1½ knots per hour).—The flood current begins to run to the northeastward at Great Round Shoal Lightship two hours before it is low water at Vineyard Haven.

Great Round Shoal Lightship (ebb current: Average strength, 2 knots per hour).—The ebb current begins to run southwesterly at Great Round Shoal Lightship two hours before it is high water at Vineyard Haven.

The south channel (flood current: Average strength, 1½ knots per hour).—The flood current begins to run northerly in the south channel from Fishing Rip to Cape Cod 10 minutes before it is low water at Vineyard Haven.

The south channel (ebb current: Average strength, 1½ knots per hour).—The ebb current begins to run southerly in the south channel from Cape Cod to Fishing Rip 10 minutes before it is high water at Vineyard Haven.

Handkerchief Lightship (flood current: Average strength, 1½ knots per hour).—The flood current begins to run to the eastward at the Handkerchief Lightship one hour before it is low water at Vineyard Haven.

Handkerchief Lightship (ebb current: Average strength 1½ knots per hour).—The ebb current begins to run to the westward one hour before it is high water at Vineyard Haven.

Cross Rip Lightship (flood current: Average strength ¾ knot per hour).—The flood current begins to run easterly at the Cross Rip Lightship when it is low water at Vineyard Haven.

Cross Rip Lightship (ebb current: Average strength 1 knot per hour).—The ebb current begins to run westerly when it is high water at Vineyard Haven.

West Chop (flood current: Average strength 2½ knots per hour).—The flood current begins to run easterly off West Chop in ship channel 45 minutes after it is low water at Vineyard Haven.

West Chop (ebb current: Average strength 2½ knots per hour).—The ebb current begins to run westerly off West Chop in ship channel 45 minutes after it is high water at Vineyard Haven.

Woods Hole Passage [1] (flood current: Average strength 5 knots per hour).—The flood current begins to run southeasterly in Woods Hole passage from Buzzards Bay to Vineyard Sound one hour before it is low water at Vineyard Haven.

Woods Hole Passage [1] (ebb current: Average strength 5 knots per hour).—The ebb current begins to run northwesterly in Woods Hole passage from Vineyard Sound to Buzzards Bay one hour before it is high water at Vineyard Haven.

Quicks Hole Passage (flood current: Average strength 2½ knots per hour).—The flood current begins to run southerly in Quicks Hole Passage from Buzzards Bay into Vineyard Sound 10 minutes before it is low water in Vineyard Haven.

Quicks Hole Passage (ebb current: Average strength 2½ knots per hour).—The ebb current begins to run northerly in Quicks Hole Passage from Vineyard Sound into Buzzards Bay 10 minutes before it is high water in Vineyard Haven.

Gay Head (flood current: Average strength 1 knot per hour).—The flood current begins to run easterly off Gay Head in ship channel when it is low water at Vineyard Haven.

Gay Head (ebb current: Average strength 1½ knots per hour).—The ebb current begins to run westerly off Gay Head in ship channel when it is high water at Vineyard Haven.

EXHIBIT L.

LETTERS FROM FISHERMEN, TESTIFYING TO THE BENEFIT AND ADVANTAGE OF THE CAPE COD CANAL AS A HARBOR OF REFUGE FOR FISHING VESSELS.

LETTER OF MR. M. N. ERNOCKE.

GLOUCESTER, MASS., *February 24, 1911.*

GENTLEMEN: I desire to inform you that the schooner Gracie E. Freeman of this port, and of which I am captain and owner, has taken advantage of the protection afforded by your breakwater at Sandwich, Mass., recently and I assure you that I have found the breakwater at that place of great advantage to vessels which have heretofore been exposed to the northeast winds which prevail in Barnstable Bay.

Very truly yours,

MATTHEW N. ERNOCKE.

Commodore J. W. MILLER,
Vice President Cape Cod Construction Co.,
New York, N. Y.

LETTER OF CAPT. MANUEL SILVA.

GLOUCESTER, *February 2, 1911.*

DEAR SIR: Having taken advantage of the harbor formed by the breakwater of the Canal Co. at Sandwich, I wish to state that it is a great protection from the northeast winds and is as smooth as a mill pond.

Respectfully, yours,

Capt. MANUEL SILVA,
Of Sloop Diana.

Capt. J. W. MILLER.

---

[1] The velocity of the current in Woods Hole Passage, high course tides, is 6 knots; low course, 4 knots. Strangers should therefore proceed with caution, and not attempt this passage without a commanding breeze or power. (See Eldridge's Chart of Woods Hole, No. 43.)

LETTER OF MR. W. O'DONNELL.

PROVINCETOWN, *January 22, 1911.*

DEAR SIR: I have yours of the 20th instant. While fishing in Barnstable Bay last week and wishing to make a harbor rather than to beat to my home port, Provincetown, I ventured to try the breakwater now being constructed at Sandwich, and found it safe and convenient, just the harbor our fishing vessels require, who have heretofore been exposed to the northeast wind prevailing in this portion of our bay. It is truly a harbor of refuge and a godsend for Cape Cod fishermen.

Yours, truly,

WILLIAM O'DONNELL,
Master of schooner Lucy B. Winsor.

Capt. J. W. MILLER.

LETTER OF MR. GEORGE W. WRIGHT.

ROCKPORT, MASS., *January 23, 1911.*

DEAR SIR: I learn from my captain that he has taken advantage of the protection afforded by your breakwater. We have found the breakwater at Sandwich, Mass., of great advantage to our vessels. The captain tells me it is like lying in a mill pond. He also speaks very highly of your representative at the canal.

Yours, truly,

GEORGE W. WRIGHT,
Owner of the sloop T. H. McMorrow and sloop Tessie P.

Mr. J. W. MILLER.

LETTER OF MR. R. N. VEEDER.

SANDWICH, MASS., *January 4, 1911.*

To whom it may concern:

I find the Cape Cod Canal entrance on Cape Cod Bay side a most excellent anchorage and protection from all winds and storms. The reason for such is, in my opinion, the breakwater being built at entrance of canal, keeping out all undertow and sea.

Respectfully,

ROBERT N. VEEDER,
Master U. S. S. Phalarope.

LETTER OF MR. M. J. DILLON.

GENTLEMEN: I have talked with Capt. Proctor of the schooner Florida regarding the advantages afforded by the breakwater there.

He says emphatically that it is a great boon afforded to vessels in a northeast wind, and he can not give it too much praise, and it is evident to me or the owners of sailing vessels that it is a great advantage over what it has been heretofore.

Respectfully, yours,

M. J. DILLON.

CAPE COD CONSTRUCTION CO.

LETTER OF MR. NAT. NELSON.

GLOUCESTER, *December 13, 1910.*

DEAR SIR: Your letter concerning the new breakwater was received by me some little time ago. Would state in answer to the same that my boat (sloop Sarah) having taken advantage of the new breakwater finds it a very good protection.

Respectfully, yours,

NAT. NELSON, *Owner.*

Capt. J. W. MILLER.

LETTER OF CAPT. S. HANSEN.

GLOUCESTER, MASS., *December 19, 1910.*

DEAR SIR: I just received your letter from the captain of my sloop Sylvester. He states that he has been in your harbor or channel down to Sandwich a few times, and he says it is a safe harbor in all kinds of wind and will be a blessing for all the sailors and shipowners all over the Atlantic coast when it is ready

Yours, truly,

CAPT. S. HANSEN,
Gloucester, Mass.

LETTER OF MR. HENRY ACKERNEN.

GLOUCESTER, MASS., *December 12, 1910.*

As you have learned, I have, with my vessel, anchored in Sandwich Breakwater and have found it most convenient, for, instead of going to Plymouth, we just come in to the breakwater, and I may say that all fishermen of Gloucester appreciate the advantage of the shelter offered. I may say also that it will be, in the near future, a great port of entry.

Yours, truly,

HENRY ACKERNEN, *Master.*

H. MILLER,
New York.

LETTER OF CAPT. JOHN F. BARRETT.

GLOUCESTER, MASS., *December 8, 1910.*

GENTLEMEN: Yours of November 21 received, and in reply will say in favor of Cape Cod Canal: There is a large fleet of schooners to small sloops fishing in Barnstable Bay each winter, from about November 1 to April 1, and this winter they have fished with ease and comfort on account of the shelter afforded by Cape Cod Canal. Most fishing in the bay is done about 16 miles from Plymouth and about same distance from Provincetown, and with fresh northerly winds it is hard work and very disagreeable in going to either Plymouth or Provincetown, and not very good harbors at that. Our fishermen have made losses in Provincetown and many losses in Plymouth by standing since they have begun fishing over that way. Now there is the benefit already of the canal, they are fishing mostly 3 to 5 miles from canal, and when they are through the day's fishing all they have to do is just go in without any trouble.

To illustrate: During the last November just past fresh and strong northerly winds most every day, and our fishermen shared more money than for any month in the history of the bay fishing, for they fished about every day, knowing they could at any time have a fair wind to shelter of canal. Were it not for that, they would not have fished more than one or two days a week, and some would have made but very little money. It is also a great benefit to any vessel caught in the bay, for in place of a lee shore to look at there is a good safe harbor.

Yours, respectfully,

CAPT. JOHN F. BARRETT,
Schooner Lillian, Gloucester, Mass.

P. S.—You can use this letter any way you wish, in whole or in part.

CAPE COD CONSTRUCTION CO.,
New York, N. Y.

LETTER OF CAPT. JOHN NELSON.

GLOUCESTER, MASS., *December 7, 1910.*

DEAR SIR: I have used the new breakwater for protection in the schooner Reliance. I think it a fine harbor for all vessels to anchor—a decided improvement for the safety of crafts.

Respectfully, yours,

CAPT. JOHN NELSON,
Part Owner of Schooner Reliance.

CAPE COD CONSTRUCTION CO.,
New York, N. Y.

LETTER OF MR. J. P BARRETT.

GLOUCESTER, MASS., *December 4, 1910.*

SIR: I have taken advantage of protection afforded by your breakwater at Sandwich and find it a great harbor. It is a great benefit to us, even if we do not use it, for we would go down in the bay fishing when we would not think of going if the harbor wasn't there. Wishing you every success in your undertaking,

Yours, sincerely,

JACOB P. BARRETT,
Master and Owner of Schooner Marguerite

J. W. MILLER.

LETTER OF MR. S. N. BEARDSLEY.

NEW ENGLAND FISH EXCHANGE,
Boston, Mass., November 23, 1910.

DEAR SIR: Have your letter of the 21st. The schooner Mabel E. Leavitt did take advantage of the protection afforded by your breakwater and the captain reported to me that he found same to be of great advantage to vessels which have been exposed to the northeast winds heretofore.

Very truly, yours,

S. N. BEARDSLEY, *Agent.*

Capt. J. W. MILLER,
Vice President Cape Cod Construction Co.,
New York, N. Y.

LETTER OF MR. C. H. SMITH.

48 EASTERN AVENUE,
Gloucester, Mass., November 27, 1910.

DEAR SIR: Your communication of the 21st instant at hand. I desire to state that I have found the breakwater of great advantage to small boats and vessels seeking shelter from the northeast winds of Massachusetts Bay. Prior to the construction of this breakwater there has been no safe harbor for vessels on the south shore either at Plymouth or Provincetown. I consider your undertaking of great advantage to small vessels.

Very truly, yours,

CHARLES H. SMITH,
Captain, Sloop Nautilus.

Capt. J. W. MILLER,
Vice President Cape Cod Canal Co.

LETTER OF CAPT. CHARLES NELSON.

GLOUCESTER, *November 25, 1910.*

DEAR SIR: In reply to yours of the 21st, would say that both schooners Mary Emerson and Little Fannie have harbored at Sandwich and have found it a very convenient and safe harbor in all sorts of weather, especially northeast winds.

Yours respectfully,

CAPT. CHARLES NELSON,
Owner of schooners Mary Emerson and Little Fannie.

CAPT. J. W. MILLER.

ROCKPORT, MASS., *November 23, 1910.*

DEAR SIR: As owner of quite a fleet of vessels and reaping the benefit derived from using the protection afforded by the Breakwater at Sandwich, Mass., I wish at this time to record my appreciation and enter my approval of the great benefit to masters and owners alike of vessels using said protection. As one of my captains exclaimed after anchoring there: "It was like a mill pond, and the holding ground is one of the best." The northeast winds prevalent in Barnstable Bay have no terrors for captains and owners now that the breakwater has at last been realized.

Yours, very respectfully,

ALBERT STORY.

Capt. J. W. MILLER,
Vice President Cape Cod Construction Co.

EXHIBIT M.

COPY OF PETITION OF MASTERS, MATES, AND PILOTS OF AMERICAN SHIPS FOR ADDITIONAL BREAKWATERS, LIGHT VESSELS, AND DEEP-WATER SHELTER IN CAPE COD BAY, AND OTHER AIDS OF NAVIGATION.

[Original petition sent by the Sandwich Board of Trade to the honorable Secretary of War on Mar. 8, 1911, and acknowledged by the War Department on Mar. 15, 1911.]

Whereas we, the undersigned [signatures printed in tabular form] masters, mates, and pilots of American steamers, realizing that the speedy completion of the Cape Cod Canal is now an assured fact and that the cutting and maintaining a channel across Handkerchief Shoals (to replace the old Slue Channel), Pollock Rip, will be a difficult and expensive operation, respectfully request that the appropriation for the construction and maintenance of said channel be applied to additional breakwaters, light vessels, and deepwater shelter in Cape Cod Bay, and other aids to navigation, thereby insuring a permanent, reliable, and at all times practical route along the Massachusetts coast.

Name.	Harbor.	Rank.	Name of steamer.	Port.
M. E. Bauman	1	Second officer	City of Memphis	Savannah.
J. H. Driggs	14	First officer	Juniata	Baltimore.
Chas. James	14	Master	do	Do.
A. H. Brooks	14	Second officer	do	Do.
Seth L. Chamberlain	2	do	Indian	Philadelphia.
B. B. Baker		Master	F. C. Hersey	Boston.
Thos. N. Lloyd	2	do	Lenape	Philadelphia.
E. E. Miller	4	do	James Wolly	
F. N. Griffin	4	do	Jennie	Boston.
F. Guitmer		do	Chas. Gallagher	Do.
Geo. W. Wainwright		Mate	Coastwise	Do.
S. S. Harris	9	Second officer	do	Do.
C. Ryerson	1	First officer	City of Memphis	Savannah.
W. J. Reed	4	Mate	Late L. V. 73	
F. A. Greenwood	4	Pilot	H. Preston	Boston.
W. Crowell	4	Master	Wm. S. Williams	Do.
S. W. Ross	4	do	H. A. Matthews	Do.
Joseph Ross	4	do		Do.
E. C. Perkins		do	Blanch	Do.
Charles H. Swen		do	Nellie	Do.
A. P. Doane		do	Doane tugs	Do.
J. Johnson		do	Kershaw	Baltimore.
A. G. Hurcley		Chief officer	do	Do.
John Studgins		Master	Nantucket	Do.
A. C. Smith		First officer	Gloucester	Do.
J. McDorman	2	Master	do	Do.
R. L. Thrift	14	Second officer	do	Do.
R. G. McLaughlin	2	First officer	Persian	Philadelphia.
W. M. Ingalls	2	Second officer	do	Do.
C. H. Simmons		do		
E. M. Connelly		Master	Essex	Baltimore.
G. D. Robinson		First officer	do	Do.
C. B. Ricketson		Master	Mount Hope	Providence.
M. B. Rich		Pilot	do	Do.
I. Kelly	4	Master	Georgia	
F. H. Bunce	1	Pilot	do	
Wm. Todd		Mate	do	
C. H. Warren	75	Pilot	North Star	
E. R. Colbeth	75	First officer	do	
A. F. Gray		Second officer	do	
Thos. J. Sammon	1		Millinocket	
Frank S. Terry		Master, unattached		
A. Anderson	1	do		
William Muller	1	do		
K. Olsen	1	do		
A. J. Watson		Second officer	Berwin	
A. F. Johnson		Master	City of Columbus	
A. C. Forward		Chief officer	do	
G. Brown	1	Second officer	do	
T. L. Drever		Master	City of Atlanta	Savannah.
J. E. Nelson		First officer	do	Do.
A. M. Rich	2	Master	Pawnee	
John A. Allen	2	Second officer	do	
P. Lewis		Master	North Star	
J. A. Peterson	75	Pilot	do	
G. H. Rowland		do	Tennessee	
Geo. T. Phillips		Master		
W. G. Townsend		First Officer	Delaware	
John E. Russell	1		Seaboard	
F. G. Avery		Master	Concho	
G. G. Davis		Chief officer	do	

Name.	Harbor.	Rank.	Name of steamer.	Port.
Chas. W. Mason		Master	Satilla	Bath.
F. P. Robinson	1	First officer	do	Do.
C. F. Adams	1	Second officer	do	Do.
C. O. Rockwell		Marine superintendent	Clyde S. S. Co	New York.
W. S. French	2	Master	Delaware	
W. Clark	4	Chief officer	Apache	
John F. McGrath		Marine superintendent	Munson Line	Do.
M. P. Oakes	1	Pilot	Seaboard	
N. R. Dunbar		Chief officer	Chelsea	
C. S. Burg		Master	City of Savannah	Savannah.
M. O. Olsen	1	First officer	do	Do.
O. Hansen	1	Second officer	do	Do.
C. A. Cavileer		First officer	Sabine	
S. L. Crossing		Port captain	Ward Line	New York.
John Dimes	4	First mate	Bay View	Searsport, Me
Chas. Beveridge	4	Second mate	do	Do.
A. L. Olendorf		do	Monterey	New York.
F. W. Mein		Third mate	do	Do.
H. H. Stilling	1	Master	Anago	Do.
C. I. Heath	1	do	Annie L	Do.
John Clark	1	do		
Robert Ayers	1	do	James Watt	Do.
George B. Tibbs	1	do	Interstate	Do.
John Boardman	1	do	Adonis	Do.
John J. Sullivan	1	do	Portchester	Do.
Edward Savage	1	do	Angler	Do.
John Tully	1	do	R. G. Packer	Do.
James D. Gully	1	do		Do.
Frank Elgars	1	do		Do.
W. J. Ryan	N. A	do	Ward Line	Do.
L. Collins		Port captain	Savannah Line	Do.
F. A. Young		Master	Denver	Do.
B H. Garfield	1	First officer	City of St. Louis	Savannah.
J. P. Gavitte		do	Denver	New York.
F. Sheridan	77	Third officer	do	Do.
E. G. Lamb	1	Second officer	do	Do.
E. Nilsson		First officer	Millinocket	Do.
A. L. Renick	1	Third officer	Comal	Do.
E. H. Darling	N. A	First officer	Arapahoe	Do.
Geo. Price		Master	Savannah Line	Do.
Walter M. Jargello		Second officer	City of St. Louis	
J. S. Bibber		Master	New Haven	New London.
A. T. Rowland		Pilot	do	Do.
J. F. Collen		Mate	do	Do.
A. Lester		do	New London	Portland.
E. R. Geer		Master	City of Brockton	Fall River.
D. Barrett		Pilot	do	Do.
W. P. Staples		do	do	Do.
E. J. Hardy		Master	Richard Peck	
J. L. Hancourt		First pilot	do	
E. Ellison		First mate	do	
G. S. Harris		do	Pawnee	
F. T. Burkhart	N. A	Second officer	Mexico	New York.
P. J. Hassell	N. A	Third officer	do	Do.
R. Willmot	N. A	First officer	do	Do.
F. L. Miller		Master	do	Do.
Saml. Charles		do	Manna Hata	Philadelphia.
J. B. Reynolds		First officer	do	Do.
M. W. Cockran		Second officer	do	Do.
E. B. Hallenbeck	1	Master		
C. J. Garrod	1	do		
John F. Bows	1	do		
Frank Cassidy	1	do	Mutual	New York.
Jas. Ellis	1	do	Thos. J. Timmins	Do.
H. H. Webber		Master	Pequonnock	Fall River.
F. S. Hayes		First officer	City of Montgomery	Savannah.
H. C. Johnson		Pilot	Pequonnock	Fall River.
J. R. Henry		do	do	Do.
C. B. Sullivan		Mate	do	Do.
F. Briggs		Master	Washington	New York.
C. H. Cugle		First officer	El Siglo	
Geo. White	18	do	Excelsior	
Wm. Birney	18	Master	do	
W. H. Carver	N. A	Second officer	El Siglo	
C. H. Freeman		Master	do	
E. B. Williams		Marine superintendent	New York Transportation Co.	
Jas. S. Garvin		Master	Brazos	
L. E. Congdon	N. A	First officer		
E. A. Clark	do	Second officer	Brazos	
E. A. Middleboro	do	Third officer	do	
J. K. Chadwick	Neptune	First officer	Huron	Do.
E. T. Atkinson	1	Second officer	do	Do.
M. B. Mattson		Master	El Monte	Do.

Name.	Harbor.	Rank.	Name of steamer.	Port.
H. Michaelis		Chief officer	El Monte	New York.
H. G. Yordt	Neptune	do	El Valle	Do.
E. H. Mercer	do	Second officer	Alamo	Do.
T. Baker	do	Chief officer	do	Do.
R. F. Burns	1	Second officer	City of Atlanta	Do.
J. M. Smith		Port captain	Standard Oil Co	Do.
E. Smith		do	Texas City S. S. Co	Do.
E. F. Parker		Master	El Mundo	Do.
F. A. Gower	Neptune	Chief officer	do	Do.
H. F. Boyd		Master	Antilles	Do.
C. Unsworth		Chief officer	do	Do.
A. J. Clancey	Neptune	Second officer	do	Do.
A. Jorgenson	do	do	El Mundo	Do.
F. O. Ardahl		First officer	Comanche	Do.
C. M. McIntosh		Master	Alamo	Do.
Chas. B. Steele		Second officer	Sabine	Do.
E. D. Johnstone		Master	Neuces	Do.
H. M. Hamaeg	1	Chief officer	do	Do.
Wm. G. Turner	1	Second officer	do	Do.
C. B. Parsons		Master	Ex president New York Maritime Exchange.	Do.
W. M. Willet		Chief officer	San Jacinto	Do.
Alfred Clifford	Neptune	Second officer	do	Do.
E. M. Frasier	do	Chief officer	Navahoe	Do.
Jacob Martin	do	do	Iroquois	Do.
L. W. Perkins		do	Ochemulgee	Do.
E. J. Smith		Master	Lampasses	Do.
A. G. Thompson	1	Chief officer	do	Do.
C. W. Deverouz		Master	Algonquin	Do.
G. H. Clifford	Neptune	Chief officer	Mohawk	Do.
G. W. Mittenberg	do	Second officer	do	Do.
J. E. Lorenze	do	First officer	Algonquin	Do.
H. S. Andressen		Master	Yacht Dielta	Do.
John H. Graham		Marine superintendent	A. H. Bull S. S. Co	Do.
Charles Le Vere	1	Pilot	Howard Carroll	Do.
David E. Love		Master	Guiding Star	Do.
Frank L. Kinney		do	Rio Grande	Do.
Orwald A. Strom	Neptune	First officer	do	Do.
W. J. Connell		Port captain	Luckenbach S. S. Co	Do.
David Lloyd		Marine superintendent	N. Y. & P. R. S. S. Co	Do.
J. W. Macken	1	First officer	City of Augusta	Do.
H. Iverson		do	North Western	Do.
Geo. O. Pierce	4	Master	Tug Astral	Do.
Peter Arenson	4	Mate	do	Do.
James J. Jensen		Master	Admiral Schley	Philadelphia, Pa.
James C. Lombard	2	Chief officer	do	Do.
Louis Costa	2	First mate	Delaware	Do.
W. G. Muney	2	Master	Delaware River Ferry Co.	Camden, N. J.
W. C. Haverstraw	2	do	Tug Varuna	Philadelphia, Pa.
T. M. Hiskey	2	do	Philadelphia & Camden Ferry Co.	Do.
John O'Neil	2	do	Tug Jas. Berry	Do.
John C. Wheaton	2	do	Tug Harriet	Do.
Adam Herner	2	Mate	Algiers	Do.
George W. Godfrey	2	Master		
Chas. E. Wheeler	2	do		
Robt. J. Lucas	2	do		
Warren E. Maxwell	2	do		
J. S. Howes		do	Itasca	Do.
Herman F. Parker		First officer	do	Do.
Frank P. Corkum	4	Second officer	do	Do.
P. Thacher		Master	Persian	Do.
Jas. Mackenzie	1	First officer	Berkshire	Do.
B. G. Birdsall		Master	Dorothey	Do.
C. L. Walker Towing Co				Do.
L. R. Tucker Towing & Trans. Co.				Do.
A. S. Hughs & Sons Towing & Trans. Co.				Do.
F. W. Munn Towing & Trans. Co.				Do.
Jas. McCauley Towing & Trans. Co.				Do.
P. N. McAvoy Towing & Trans. Co.				Do.
Miles Hillary	4	Master	Indian	Do.
Jas. A. Crocker	4	First officer	do	Do.
M. S. Flynn	2	Second officer	Berkshire	Do.
Lawrence Simmons		Master	New York	New York, N. Y.
Silvia Gladulich	1	Second officer	do	Do.
Howard Fay		Marinesuperintendent.	P. & R. Trans. Co	Philadelphia, Pa.
Harry F. Horner	2	Master	Tug Alert	Do.
Chas. Thomas		do	Tug Bristol	Do.
Jas. Curran		do	Tug Evening Star	Do.

Name.	Harbor.	Rank.	Name of steamer.	Port.
Isaac R. Franz		Owner	Tug Madira	Philadelphia, Pa.
J. L. Williamson	2	Master	Tug John I. Brady	Do.
Jas. Gallaher Steam Towing Co.				Do.
F. F. Martin Steam Towing Co.				
R. S. Dodge		Master		Do.
B. D. Reese	2	do		Do.
Joseph Whitaker	2	Chief officer	New York	Do.
W. Townsend		Master	Goldsboro	Do.
J. L. Williams		Chief officer	do	Do.
W. C. Briggs		Master	Grecian	Do.
W. D. Chase		Chief officer	do	Do.
J. B. Colbert	2	Second officer	do	Do.
J. P. Farmer, jr		Master	Allegheny	Do.
C. O. C. Briggs		First officer	do	Do.
Martin Francis		Second officer	do	Do.
Dennis McDevitt		Tugboat owner		Do.
Stannard Towboat Co.				Do.
C. E. Davis		Manager	Red Star tugs	Do.
Albert F. Brown		Tugboat owner		Do.
O. M. Rogers		Master	New Orleans	Do.
R. P. Doran		First officer	Tuscan	Do.
Independent Towing & Trans. Co.				Do.
F. B. Knight	Neptune	Master	Havana	New York, N. Y.
W. B. Oakley	1	Second officer	Rio Grande	Do.
Theo Catharine		Master	Munroe	Do.
Fred Bangs	1	First officer	do	Do.
Sidney Albery	14	Second officer	do	Do.
F. B. Dalzell		Manager	Dalzell Towing Co	Do.
Henry Crew		Tugboat owner		Do.
Sam'l L. Hommedieu		do		Do.
Thos. Flannery		do		Do.
F. A. Egerton		do		Do.
Walter S. Pilland		Manager	Cahill Towing Co	Do.
Joseph O'Leary	Neptune	Master		
John Dumphy	do	Mate	Coma	Do.
Rob't H. Cowan	do	Master		
Jas. J. Madison	do	Third officer		Do.
L. F. Parker	do	Master	Navahoe	Do.
B. Erdale	do	Second officer		
F. A. Hanyford	do	Master		
A. W. Haynes	do	Chief officer	Alliancia	Do.
C. Cornelius	do	Third officer	do	Do.
A. G. Anderson	do	Second officer	Comanche	Do.
Arthur J. Jenselwhite	do	do	Alliancia	Do.
F. W. Silvers	do	do	Arapahoe	Do.
W. B. Keith	do	Third officer	do	Do.
T. Evans	do	Master	San Juan	Do.
William McLean		do	S. V. Luckenbach	Do.
Robert Nicholson		Chief officer	do	Do.
K. Exstrom	Neptune	First officer	Seguranca	Do.
P. Larsen	do	Second officer	do	Do.
G. Webbe	do	Third officer	do	Do.
F. H. Scott		Manager	Scott Wrecking Co	Do.
James McAllister		do	McAllister Towing Co	Do.
S. M. Tomming		Mate	Yale	Do.
Otto A. Toldness		First officer	San Juan	Do.
George I. Kuhnart	1	Chief officer	Cherokee	Do.
James Byrne		Master	Kennebec	Do.
James C. Catharine	4	Mate	do	Do.
Thomas Thobald		Second officer	Santiago	Do.
T. H. Laurant		First officer	Merida	Do.
C. W. Hafley	1	Mate	Honduras	Do.
William Howard	Neptune	Master		
E. B. Lamher		do	Canaguey	Do.
R. F. Crosby		First officer	do	Do.
J. J. Clark		Chief officer	Colon	Geo.
William J. Smith	Neptune	Third officer	do	Do.
George P. Woodward	do	Master	El Mar	Do.
R. F. Randolph		Superintendent of tugs	Southern Pacific Co	Do.
E. F. Pinchon		First officer	El Rio	Do.
J. L. Charles	14	do	Chesapeake	Do.
John G. Hulphers		Master	Madison	Do.
Oscar J. Young		First officer	do	Do.
James Jensen		Second officer	do	Do.
F. Mahoney	1	Master	Clifton	Do.
John C. West	1	do	Ontario	Do.
Albert E. Bouchard	1	do	C. Callaher	Do.
M. F. Shaughnessy	1	do		Do.
M. Tierney	1	do	George S. Price	New York.
Robert F. Powers	1	do	Thomas Tracy	Do.
Robert Bieling	1	do	Sarah Thorp	Do.

Name.	Harbor.	Rank.	Name of steamer.	Port.
Thomas J. Moore	1	Master	General Otis	New York.
Felix P. Grimes	1	do	Egerton	Do.
F. Rainard	1	Pilot	Angler	Do.
John G. Gully	1	Master	Brooklyn	Do.
C. W. Haley	1	do	Albert R. Green	Do.
Gus Sveburg	1	do	O. Z. Hallenbeck	
John Welsh	1	do	O'Brien	Do.
Ashton Jewell	1	do	J. V. Craven	Do.
John Sheehan	1	Pilot	John Lenox	Do.
Harry C. Denger	1	Master	Charles Runyon	Do.
A. Rockefeller	1	do	Phoenix	Do.
H. Mosier	1	do	Volunteer	Do.
T. Larsen	1	do	H. O'Brien	Do.
Joseph Stork	1	do	E. F. Moran	Do.
John Lynch	1	do	Columbia	Do.
J. Kelly	1	do	Florence	Do.
Fred F. Langan	1	do	N. R. Randreson	Do.
Chris Neilson	1	Pilot	Automatic	Do.
Robert Moon	1	Master	Asa C. Hudson	Norfolk.
Darius Pierce	1	do	Gerry	New York.
Luke T. Guinan	1	do	Dana	Do.
R. H. Larkin	1	do	Margaret	Do.
Frank Gully	1	do	P. J. C. No. 7	Do.
Michael F. Morren	1	do	Bouker	Do.
Edward Monk	1	do	May McGuire	Do.
E. C. Potter	1	do	Shurman	Do.
John Miller	1	do		
Joseph F. Rea	1	do	Annie L	

OFFICE OF INDEPENDENT HARBOR NO. 1,
No. 17 South Street, New York City.

At a regular meeting of Independent Harbor No. 1, held at their meeting rooms, No. 17 South Street, New York City, the following resolution was passed:

Whereas our attention has been called by the Sandwich Board of Trade to the necessity for the protection of life, vessels, and property of a breakwater at Sandwich, Massachusetts Bay, for vessels entering and leaving the Cape Cod Canal in bad weather, and that the proposition appeals to us as practical steam boatmen: Be it therefore,

Resolved, That we, Independent Harbor No. 1, as a body, indorse their efforts and give the approval of our organization to the Sandwich Board of Trade to say that this harbor is heartily in sympathy with the movement and hope it may meet with success.

INDEPENDENT HARBOR NO. 1.
ROBERT F. BOWERS, *President.*
[SEAL.] EDWARD SAVAGE, *Secretary.*

Question No. 14: Tidal currents. These should be studied not merely in their relation to maintenance and to their effect upon traffic, and not merely to their existence in and through the canal, but in the waters at the respective entrances and, if necessary, with a view to their control. This subject also should be comparatively stated in order that the conditions respecting tidal currents may be known, not only with immediate relation to the canal and its entrances, but with comparative relation to the tidal currents in and near Pollock Rip and on the eastern coast of Cape Cod. It is not sufficient to know what the local tidal conditions are at the canal itself. There should be added knowledge of whether these conditions are greater or less, better or worse than similar conditions in waters through which ships must pass if they do not use the canal.

Answer: The chief element affecting the current velocity is the slope of the water surface. From United States Coast Survey bench marks at Back River (Buzzards Bay end of canal) and Sagamore Beach, Cape Cod Bay, supplemented by a careful line of levels run by the party from this office, the mean low water of Buzzards Bay is found to be 4.84 feet above the mean low water of Cape Cod Bay. (The actual head on August 26, 1916, when observations were made from which deductions were made by Mr. Parsons of the canal company was 5.96 feet.)

With a head of 4.84 feet, the mean slope (straight line from one end to the other) is 0.00012. Applying Kutter's formula, $V=c\sqrt{rs}$, with a section 200 feet bottom

width, 40 feet depth with side slopes of 1 on 2, and a section of same bottom width and slope with 35 feet depth, the following results are found:

	40-foot depth.	35-foot depth.
Wetted perimeter=p=	378.88	356.4
Area of section=a=	11,200	9,450
Hydraulic radius=$r=\frac{a}{p}$=	29.56	26.51
Slope=s=	0.00012	0.00012
$\sqrt{rs}$=	0.0595	0.0563

$$V=c\sqrt{rs}$$

The coefficient c, dependent upon the roughness, size, shape, and slope of the canal, is taken from tables derived from the experimental investigations, and is found to be as follows, for assumed values of n, the coefficient of roughness.

	Feet per second.	Miles per hour.		Feet per second.	Miles per hour.
For 40 feet deep section:			For 35 feet deep section:		
When n=0.02 =128 then V=	7.61	5.11	When n=0.02 =126 then V=	7.09	4.83
When n=0.025=108 then V=	6.42	4.37	When n=0.025=106 then V=	5.97	4.07
When n=0.03 = 95 then V=	5.65	3.85	When n=0.03 = 93 then V=	5.24	3.57

By the same formula applied to a section 100 feet wide on the bottom 25 feet deep with side slopes of 1 on 2, the theoretical section of the existing canal, it is found that when n is taken as 0.02, the velocity resulting is 3.90 miles per hour, when n is taken as 0.025, the computed velocity is 3.09 miles per hour, and when n is taken as 0.03, the velocity is 2.69 miles per hour.

In the section very carefully measured by the Canal Company, in a straight piece of the canal of uniform cross section and the results and methods both checked by a representative of the United States Coast Survey and by the engineer of the Harbor and Land Commissioners of Massachusetts, the mean velocity of the current was found to be 2.79 knots (a knot stated to be 6,080 feet) which is equivalent to 3.21 miles per hour, while the computed velocity with the slope taken at 0.00012 is 3.09 miles per hour, so that it is highly probable that a value of n as 0.025 is a very close approximation to its true value, and with this mean head of 4.84 the mean velocity of the current in a channel 200 feet bottom width and 40 feet deep would be about 4.37 miles per hour, and in a canal of the same width and 35 feet deep would be about 4.07 miles per hour.

But the head under which these velocities are produced is subject to considerable changes by reason of the spring and neap tides and to a greater extent by long continued storms.

There is below a table giving the theoretical velocities resulting from heads varying from 4.5 to 9.5 feet and for sections of 40 feet and 35 feet depth.

Velocities for different heads and sections.

Both sections 40 feet deep.				Section 35 feet deep.		Velocities.			
						Section 40 feet deep.		Section 35 feet deep.	
Head in feet.	Slope=s Canal ends 40,000 feet apart.	$\sqrt{rs}$ in which r=29.56.	C.	$\sqrt{rs}$ in which r=26.51.	C.	Feet per second.	Miles per hour.	Feet per second.	Miles per hour.
4.5	0.0001125	0.0577	107	0.0546	105	6.17	4.21	5.73	3.91
5.0	.0001250	.0608	106	.0576	105	6.44	4.39	6.05	4.13
5.5	.0001375	.0637	106	.0604	104	6.75	4.60	6.28	4.28
6.0	.0001500	.0666	105	.0630	104	6.99	4.76	6.55	4.47
6.5	.0001625	.0693	105	.0656	103	7.27	4.95	6.76	4.61
7.0	.0001750	.0719	104	.0681	102	7.48	5.10	6.94	4.73
7.5	.0001875	.0744	103	.0705	102	7.66	5.22	7.19	4.90
8.0	.0002000	.0769	103	.0728	101	7.72	5.40	7.35	5.01
8.5	.0002125	.0793	102	.0750	101	8.09	5.51	7.57	5.16
9.0	.0002250	.0816	102	.0772	100	8.32	5.67	7.72	5.27
9.5	.0002375	.0837	101	.0793	100	8.45	5.76	7.93	5.41

All of the above supposes a uniform slope from end to end of the canal, but this does not exist in the present canal for various reasons, some of which are analyzed from the purely scientific point of view in Mr. Parsons's paper.

The only deduction to be made from the above is that under certain heads and cross sections as indicated, the mean velocities will approximate those stated in the table. In computing these velocities, cross sections 200 feet bottom width, side slopes of 1 on 2 and depths of 40 feet and 35 feet have been used, but these depths are not exactly correct, for the maximum head occurs at about high water at one end and half tide at the other so that really the depth of water at the actual section under consideration is somewhat greater than the proposed low water depths and depends upon the location of the section in the canal, the range of tide at one end being about 4 feet and at the other end about 9 feet, with ranges at intermediate points varying between them.

It is not believed that small fractions of a mile per hour in the velocity are of very much consequence to the navigator in passing through the canal, but that whether the velocity is 3, 4 or 5 or more miles per hour may be of vital consequence to him. The passage of Woods Hole Strait is made daily by steamboats negotiating a current (with or against) probably much stronger than would be found in the Cape Cod Canal, but the passage is short and straight while the canal is much longer and curving nearly its entire length between the shores of the two bays.

Question No. 15: The effect upon the food supply, if any, already caused by the opening of the canal and whether same would be enhanced or diminished by the deepening and enlargement thereof, or by the creation of a harbor of refuge at the north end. Under this heading should be determined whether there was any food fishery at either end of the canal before same was opened; whether such a food fishery has come into existence and to what extent since the opening of the canal and by reason of the facilities afforded by it.

Answer: The effect upon the food industry since the canal was opened has been very great. An average of 20 fishing vessels daily making their headquarters in the canal. These vessels arrive at the Canal Fish & Freezing Co., a plant recently completed at a cost of about $200,000, one of the most modern freezers on Cape Cod and located about one-half a mile from the eastern entrance of the canal. The fishing vessels arriving at this freezer have an average of 80 barrels of cod and flounders daily. Before the opening of the canal flounders were unknown in Cape Cod Bay near the entrance of the canal, but during the season of 1917, 4,000 barrels of food fish were caught. Prior to the opening of the canal there was no harbor for fishing vessels between Barnstable and Plymouth, resulting in little or no fishing being done in this section of Cape Cod Bay. The fishing grounds near the eastern entrance of the canal comprise the best fishing grounds in the bay. Many more fishing vessels would avail themselves of the canal if there was sufficient room for them to anchor. This subject is covered by referring to United States Coast and Geodetic Survey chart No. 1107, and also in paragraph 16.

There is attached and marked "Exhibit N," letters from representative men on Cape Cod, and who are authorities on the fishing industry, giving in detail the benefits to the fishing industry through the canal. These letters are of the greatest importance in substantiating the fact that the food supply has been increased through the canal, and is capable of further development if greater facilities are afforded to fishing vessels to anchor or lie in a widened harbor at the eastern end of the canal. There is no doubt that the fishing industry will develop and be equal to that of any fishing port on the New England coast.

Especial emphasis is placed upon the report shown in Exhibit N of the Canal Fish & Freezing Co.'s statement of the number of fish taken and shipped to markets.

Exhibit N.

LETTER OF MR. N. L. COLBETH.

Buzzard's Bay, *September 22, 1917.*

Dear Sir: Herewith brief outline of possibilities of the Cape Cod Canal in transportation of food supplies as requested.

The first principle of food distribution is to prevent waste and increase values by moving with dispatch and economy the surplus of one section to the consumer in another, and the Cape Cod Canal may become the route of a considerable portion of the food supply of New England and even remote districts.

A navigable canal, free of tolls, will undoubtedly appeal to steamers in the fruit and sugar trade between Boston and certain West India, South American, and Gulf ports, which vessels also carry large quantities of New England products to the South, notably, potatoes, apples, tinned vegetables and fish; and even to these ocean-going vessels the delay, danger, and distance of the route around Cape Cod is objectionable.

Grain and other Western products may be freighted to New England in the so-called "canal boats" via New York State Barge Canal, Hudson River, Long Island Sound and Cape Cod Canal, at an appreciable saving of cost by rail; and the above is equally true with reference to exchange of commodities between the Middle Atlantic States and New England by utilizing the Cape Cod, Raritan and Delaware & Chesapeake Canals. Steamers from Baltimore, Norfolk, Savannah, and Philadelphia transport large quantities of fruit and garden produce to Boston, and with this perishable cargo a saving of 60 or more miles of distance is an important factor. New York City, although a consuming rather than a producing section, is the distributing center for immense quantities of foodstuffs, and the Cape Cod Canal route admits of New Jersey products shipped in the late afternoon reaching Boston counters early the following morning.

Boston has now become the greatest fish market in the world, and any increase of transportation facilities makes the fisheries of Massachusetts Bay, Georges, and Grand Banks more accessible to the whole country, particularly as with iced fish every hour is valuable, but the Cape Cod Canal has a peculiar influence on the fresh-fish supply of New York City as steamer service between the canal and New York will permit early-morning delivery of shell and other fish taken in Cape Cod Bay and Vineyard Sound the previous afternoon. When this service is inaugurated, the fishing trade between Cape Cod and New York will be revolutionized, as now the fastest freight service is two days, and even passengers must leave this vicinity at 5.30 p. m. and transfer at Boston or Middleboro to arrive at New York at 7 a. m., while a fast steamer can make the trip from Cape Cod Canal to New York in 10 hours without the inconvenience of changes.

We appreciate your kind interest in local problems and take pleasure in submitting the above.

Yours, respectfully,

N. L. COLBETH,
Superintendent Boston, Cape Cod & New York Canal Co.

Hon. WILLIAM C. REDFIELD,
Secretary of Commerce, Washington, D. C.

LETTER OF MR. JOHN W. DALTON.

SANDWICH, MASS., CAPE COD,
September 22, 1917.

DEAR SIR: Agreeable to your request I am writing you at this time to state some of the great benefits that the fishermen along the coast of Cape Cod have derived from the Cape Cod Canal.

As I related to you when you were here a short time ago, never before in the history of this town, which is over 275 years old, until last year, had there been a single barrel of flounders caught off this place and shipped to market. Last year the fishing boats, taking advantage of the canal where they could enter and leave at any hour of the day or night, caught approximately 3,000 barrels of flounders off this place, landed them at the wharf of the Canal Fish & Freezing Co., and had them shipped to market. This was an entirely new industry and the coming fishing season, which begins in November, there promises to be twice as many boats fishing out of the canal than there was last year. I am of the firm belief that the bottom of Cape Cod Bay, off here, is thick with Quahaugs which can be caught and marketed at a good profit. Until the canal was built the only harbor here was of such little depth at all times, except half tide, that none but light draught boats would venture to go in and out of it, and as it requires large boats, not less than 20 feet over all, with at least 20 horsepower engines, to engage in Quahaug dredging, none of the fishermen here could engage in the industry on account of not being able at all times to get in and out of the public harbor. Last season boats from Gloucester, Provincetown, Harwich, Hyannis, Nantucket, Edgartown, New Bedford, and other places engaged in dredging for flounders off here used the canal as a landing place and harbor of refuge, being able to enter and leave there at all times. During the present fishing season vessels from all along the coast have been here landing fish and making the canal a harbor. All the fishermen say that the canal is the best harbor along the coast; it is nearer the fishing grounds in Cape Cod Bay than any other port and by its use they avoid the dangers that lurk in the waters back of the cape and on Nantucket shoals. I was born here and have always lived in this town. I am connected with the Canal Fish & Freezing Co., which had recently erected a cold storage plant on the canal and during the more than a year that I have been at the canal, almost daily, I have had opportunity to talk with the fishermen and to obtain their opinions of the waterway. By using the

canal as their place for landing their catches the fishermen are able to go to and from the fishing grounds at slight expense, gasoline consumption, they are always within a short run of it, in the event of bad weather coming on and all that it now lacks to make it just the right kind of a place for them is a basin at the eastern end where their boats can be moored out of the main channel.

I am satisfied that many other fishing boats would use the canal if there was a place for them to moor out of the main channel As it now is they are obliged to tie up at the dolphins on either side of the waterway, which in stress of weather, is often dangerous for them. Several boats, one now here fitting out, will engage in dredging for Quahaugs this season, and we also look for quite a fleet of fishing boats that will engage in netting codfish.

Last winter there was a dozen boats here through the season and we learn that they and others will return here this season. Fishing boats from other places have frequently run into the canal when entrapped by storms and during the year our boats have gone to the assistance of boats that became crippled and unable to make port. The fishing industry in the bay off here has never been developed to any extent for the reason that the public harbors only afforded sufficient water for the smaller fishing boats at half tide. I am convinced that with a basin on the eastern end of the canal, where even the largest fishing vessels could moor and be out of the main channel, that in addition to the development of the Quahaug industry that there would be a tremendous increased production of fresh fish in these waters. Lack of a harbor along this coast here, until the canal was built, has been a great handicap for the fishermen and the canal being a private enterprise many of the fishing boats do not use it on account of the charges which they consider more than they can afford to pay.

I trust that this information will be of value to you and I assure you that if I can be of any further service I shall be pleased to render it.

Yours, truly,

JOHN W. DALTON.

The SECRETARY OF COMMERCE,
Washington, D. C.

LETTER OF MR. E. S. S. KEITH.

DECEMBER 12, 1917.

MY DEAR JIM: Replying to your favor of the 3d, relative to the canal, would say that the food supply has been appreciably increased by the canal furnishing a safe and commodious landing place for the unloading and shipment of fresh fish; this applies particularly to flounders.

The coast adjacent to the entrance to the canal was not fished by flounder dredgers prior to the establishing by the construction of the canal a safe landing place, as you know, the fishing is done wholly during the late fall and winter months.

The question as to whether the enlargement of the canal or by the creation of a harbor of refuge at the north end would increase or diminish the food supply is entirely problematical, except that it could not decrease the same. On the west end of the canal there has really been no food fishery for years, owing to the prohibition by the State of Massachusetts of fish weirs and seines.

The fishing at the east end of the canal has developed as above, and has come into existence since the canal was built. The above approximately states the situation, with the exception that it would be well for you to get the total figures for last year and this year as to fish sold and shipped at the Sandwich dock; this Mr. Bryne could give you.

Trusting this will give you the desired information, and with kind regards, believe me,

Sincerely, yours,

EBEN S. S. KEITH.

Mr. J. W. BELL,
Care of A. B. Leach & Co.,
62 Cedar Street, New York City.

LETTER OF MR. JOHN C. MAKEPEACE.

WAREHAM, MASS., *December 10, 1917.*

DEAR MR. BELL: On the 3d instant you wrote me as to the effect of the Cape Cod Canal upon food supply. My delay in replying is partly due to a little thought which I have been trying to put on the subject and partly to unavoidable interruptions. Whatever I may have to say on this subject refers to conditions at the north end of

the canal, with which I am more familiar. The entire fishing development at this point is newly created by the facilities afforded by the canal and Canal Fish & Freezing Co.

The plant of the Canal Fish & Freezing Co. was put in operation too late this year to benefit by a full season's operation. Even so, they have about 20 carloads of frozen product to ship. From our fishing experience last spring we believe it will be possible next season to fill our plant to capacity, and ultimately to double and even treble our capacity. Our plant was laid out with this in view, and our machinery is ample for double the present storage capacity.

Just at the moment the greatest activity is in shipment of fresh fish from the Canal Fish & Freezing Co.'s pier. I understand the shipments last week amounted to about 450 barrels, most of them being flounders. This flounder dredging near the north end of the canal is, I understand, new ground for this kind of work, made possible by the shipping facilities afforded by the canal and the freezing company's pier. By careful fostering this industry can be developed into a very considerable enterprise.

Boats and vessels used in fishing are generally of small size, and I doubt if deepening or enlargement of the canal would have any effect upon the fishing industry, until such time as other canal traffic begins to crowd. We do believe that a basin, located near our fishing plant, for fishing boats, would be attractive to fishermen. We also believe that a harbor of refuge at the north end of the canal would be very attractive to the fishermen, particularly the cod trawlers in Cape Cod Bay, and would undoubtedly develop the fishing grounds in the vicinity, which have heretofore been dormant because of the lack of such a near-by harbor.

In a general way, we look upon the present development at this point as only the beginning of an industry of considerable magnitude. For its proper development we should have water shipping facilities to New York and Boston as soon as general conditions will permit of their establishment, and ultimately we must have rail connection running to our plant and pier. The promptness with which we can attain this much-desired development depends upon the wisdom with which our enterprise is conducted and upon close affiliation and cooperation between ourselves and the canal company. It is also subject to national conditions over which we have little control.

Very truly, yours,

JOHN C. MAKEPEACE.

Mr. JAMES W. BELL,
62 Cedar Street, New York City.

LETTER OF MR. S. M. HOLMAN.

ATTLEBORO, MASS., *December 6, 1917.*

DEAR SIR: In re your inquiry of December 3, would state that with an intimate knowledge of the conditions of the Cape Cod Canal and the fisheries question, would say the opening of the canal made possible the establishment and operation of what I believe to be the most efficiently managed fish-freezing plant on our Atlantic shores, i. e., the Canal Fish and Freezing Co., located at Towne Neck, Sandwich, on the eastern end of the Cape Cod Canal.

Because of its nearness to the fish supply and its rail and water facilities for transportation, it is an ideal location equaled by none other on the coast.

Of greatest assistance to the development of the fishery business would be the establishment of a harbor of refuge at the eastern end of the canal. As it is now, fishermen could not in large numbers lay in the mouth of the canal at night, and it would be a great drawing card for them if such a harbor could be established. I remain.

Sincerely, yours,

S. M. HOLMAN.

Mr. J. W. BELL,
62 Cedar Street, New York, N. Y.

LETTTER OF MR. J. L. BRYNE.

BOSTON, MASS., *December 18, 1917.*

DEAR MR. BELL: As a result of the opening of the Cape Cod Canal the supply of food fish has been increased during the season of 1917 by the catch of Canal Fish & Freezing Co. amounting to approximately 4,000 barrels. There are at present an

average of 20 boats daily making their headquarters in the canal. These boats are fishing for cod and flounders and are producing an average of 80 barrels daily. All of the above-mentioned fish is an entirely new supply made possible by the opening of the canal. Prior to the opening of the canal there was no boat harbor at this point, in fact no harbor between Barnstable and Plymouth, the result being that little or no fishing has been done along this section of Cape Cod Bay which comprises some of the best fishing ground in the Bay. There would be many more boats fishing from this section at this time if there were sufficient room for the boats to tie up at night.

In my opinion if the canal were widened at the Cape Cod Bay end or a suitable harbor dredged at that point there would be a great number of boats, large and small, fishing from this point. In fact, I believe that with a proper harbor and suitable shipping facilities the fishing industry covering fresh, frozen, salt, and canned fish could be developed to equal that of any fishing port along the New England coast, as the canal location has one great advantage over all other sections of the coast from the fact that the rise and fall of the tide, which is about 9 feet, together with the current through the canal, prevents the accumulation of ice and enables the boats to get out on every day that the weather is suitable. The canal is the only place on Cape Cod where this is possible, as every other harbor known to me is filled with ice at some time during the winter season.

I believe that if a harbor were developed at the easterly end of the canal there would be sufficient business to justify the stopping of the steamships running between Boston and New York at the canal, which would not only materially benefit the fishing industry but would also, in my opinion, develop the Cape towns and business generally in the vicinity of the canal.

Very truly, yours,

J. L. BRYNE.

Mr. J. W. BELL,
62 Cedar Street, New York City.

LETTER OF MR. J. W. BELL.

NEW YORK, *December 31, 1917.*

DEAR MR. COAKLEY: In answer to yours of the 27th instant, I submit herewith letters from responsible parties living in the vicinity of and familiar with the activities connected with and contiguous to the Boston Cape Cod & New York Canal.

There is little that I can say in addition to the very comprehensive information and opinions covered by these letters except that having spent a very considerable portion of my time during the past year on matters connected with the Canal Fish & Freezing Co., I have naturally become very familiar with local conditions, and my observations not only affirm all that is covered by the letters I am sending you, but I find the opinions here expressed to be the universal opinion of all those having any knowledge of the local situation and particularly of the fish freezing industry on the cape.

It is generally admitted that the Canal Fish & Freezing Co. has the most accessible plant so far as transportation facilities and accessibility to fishing grounds is concerned, and naturally the canal is responsible for this situation. It would seem, therefore, that the deepening and enlargement of the canal and the creation of a harbor of refuge would greatly enhance not only the development of the fish-food industry, but of a diversity of business activities at this point.

The plant of the Canal Fish & Freezing Co. was completed late in July. The attached figures cover the handling of fish foods for certain periods since that time.

If I can be of any further service please command me.

Yours, very truly,

JAMES W. BELL.

JOHN J. COAKLEY, Esq.,
Treasurer Boston, Cape Cod & New York Canal Construction Co.,
43 Exchange Place, New York City.

CANAL FISH & FREEZING CO., SANDWICH, MASS.

Fish packed and shipped for others.

	Barrels.		Barrels.
Nov. 17 and 18	187	Dec. 8	12
19	4	9 and 10	59
20	74	11	13
21	96	12	65
22	21	13	11
23	19	15	3
25	71	16	29
26	15	17	11
27	1	19	105
30	136	20	157
Dec. 2	27	21	88
4	152	22	20
5	122		
6	97		1,613
7	28		

Fish caught July 27, 1917, to Dec. 22, inclusive, 1917.

	To Nov. 17, 1917.	From Nov. 17, to Dec. 22.	Total.
Mackerel	11,451.00	.....	11,451.00
Whiting	56,310.00	134.00	56,444.00
Herring	11,036.00	16,267.00	27,303.00
Blue backs	1,016.00	.....	1,016.00
Squid	156,409.00	3,003.00	159,412.00
Butter fish	10,286.50	.....	10,286.50
Codfish	11,703.75	800.00	12,503.75
Pollock	1,585.00	22.00	1,607.00
Flounders	33.00	.....	33.00
Haddock	25.00	.....	25.00
Tautog	1,060.00	.....	1,060.00
Horse mackerel	60.00	.....	60.00
Hake	6,610.00	.....	6,610.00
Mixed	4,628.00	.....	4,628.00
	272,213.25	20,226.00	292,439.25

Question No. 16. The presence or absence of harbors on the south shore of Massachusetts Bay from a point commencing approximately at Plymouth, thence around the north shore of Cape Cod to its end and the advantage to fisheries, to shipping, and to commerce of the creation of a harbor on this coast, same being available both from the north and from the south (through the canal).

Answer. The only harbors commencing at Plymouth and around the north shore of Cape Cod to its end, are Plymouth, the canal entrance, Barnstable, Wellfleet, and Provincetown.

The advantage of the creation of a harbor through the construction of the canal is that one year after the dredge Mackenzie cut through the Sandwich Beach and created a harbor and the breakwater started, fishing vessels began to arrive in the new canal harbor seeking shelter it afforded, and the following is a list of the number of fishing vessels and their net tonnage which anchored in the canal harbor. Among the vessels is the United States Fisheries steamer Phalrope which vessel was engaged in the fishery service for the Government in the vicinity of the canal. See letter from the master of this vessel in Exhibit L testifying to the value of the canal harbor.

Month.	Number of vessels anchoring in canal.	Net tonnage.	Month.	Number of vessels anchoring in canal.	Net tonnage.
November, 1910	108	1,872	October, 1911	49	3,474
December, 1910	224	4,092	November, 1911	139	3,193
January, 1911	209	3,534	December, 1911	233	4,217
February, 1911	83	1,013	January, 1912	142	3,080
March, 1911	6	201	February, 1912	59	1,990
April, 1911	6	271			
June and July, 1911	9	70		1,267	27,007

An average of 79 vessels per month, and net tonnage per month, 1,688.

Question No. 17. The effect upon industries in the towns in the area adjacent to the south shore of Massachusetts Bay by reason of the ready means of transit to New York City afforded by the canal. This should be comparatively stated to show what means of transportation to New York these towns formerly had and the advantage if any, given to them by the canal, or which would accrue by its deepening, widening, and by the provision of a harbor at its northern end with dock facilities. For example, would this permit either the stoppage of steamers en route from Boston to New York to pick up passengers and freight, or would it permit the establishment of a line of steamers of suitable size and capacity connecting these bay towns with New York?

Answer. The plans of large shoe manufacturers in the Brockton district are being considered whereby the delivery of shoes can be expedited by motor trucks to a pier on the canal and thence via steamer to New York or Boston and other ports.

The board of trade of Wareham compiled figures showing that 25,000 barrels of cranberries could be shipped annually by boat from Buzzards Bay, and the shell fisheries of Buzzards Bay would be greatly assisted by prompt delivery by water to New York or Boston markets.

One of the largest car industries in Massachusetts is the Keith Car Manufacturing Co. at Sagamore. Its plant extends a distance of about 2 miles along the south bank of the canal, and if the canal were widened and deepened would enable this industry to secure its supplies of raw materials by water, thus increasing its efficiency and reducing the cost of production.

Since the canal has been opened, a fish-freezing plant of the most modern type has been located at Sandwich on land adjacent to the canal which enables the fishermen to find a quick market for the sale of their catch, and fresh fish can be delivered in the New York market 24 hours after being taken out of the water. This should eventually result in a material decrease in the cost of fish supplied to the consumer. See Exhibit N.

Incidental to the opening and operation of the canal, the Southeastern Massachusetts Electric Co. have established a transformer station at the canal, and supplies the canal company with power for its operation.

This new field for the sale of light and power places the power company in a position to furnish the neighboring towns south of the canal with light and power, thus increasing their value of activity.

The Plymouth & Sandwich Street Railway Co. are extending their line along the entire northern bank of the canal and across Sagamore Bridge to accommodate the inhabitants of Sandwich, Sagamore, Bournedale, and Bourne, with additional means of transit, and it is a well known fact that the growth of a community invariably follows additional transportation facilities.

The eastern end of the canal is a practical location for the operation of a shipbuilding and dry dock plant, and at the present time it is contemplated erecting ways for the construction of vessels to meet the demand for new tonnage. The canal is available at that point on account of its present widened prism for the launching of vessels.

As the canal will eventually become, if widened and deepened, the main route for coastwise vessels the necessity for a depot for the sale of coal and general marine supplies will quickly become apparent and consideration is given at the present time to the establishment of such a business.

It is estimated that nearly 500,000 passengers visit the cape during the year, mostly during the summer months, Many more would be attracted to this desirable region especially from the west if steamers stopped at the canal. To-day large numbers are kept away on account of the slow connections by rail.

Another important matter is the fact that the New Haven Railroad closely parallels the canal for 6 miles. Between it and the canal many desirable sites for manufacturers are available, and if the canal were widened and deepened, industries will be attracted by the creation of a deep-water harbor, with wharfage accommodations 8 miles long on each bank with the added rail facilities.

Transportation by rail heretofore has been slow requiring two days for merchandise to reach New York. There is an excellent wharf at the eastern end at which a line of steamers could dock and receive perishable freight and deliver the same in New York in 12 hours, or to Boston in 4 hours. Another pier could be built at the western entrance of the canal for the accommodation of freight and pasengers on the Woods Hole Branch of the New Haven Railroad.

The widening and deepening of the canal would allow large passenger and freight ships to lie at wharves and be well out of the fairway. The passenger travel for southeastern Massachusetts towns which now comes via Fall River or Boston, and which is very heavy, could go via steamer direct and avoid the long rail ride. The advantages to the towns in southeastern Massachusetts would be inestimable if a daily line of steamers between New York and Boston would stop at a wharf in the canal for the

discharge or taking on of passengers and freight, as it would afford express service for freight, and give passengers for New York at least four hours more at the towns in southeastern Massachusetts.

Question No. 18: Are or are not the foundations of the bridges spanning the canal already made to suit a possible future depth of 35 feet of water in the canal?

Answer: The foundations of all bridges spanning the canal have been constructed to suit a possible future depth of 35 feet of water in canal.

Question No. 19: To what extent does the canal company own land adjacent thereto along the navigable portion of the former Monument River, and what protection exists by reason of such ownership of land as there may be against claims for free navigation, wharfage rights, or other demands arising from alleged riparian rights in that former river.

Answer: The canal company owns in fee or by condemnation proceedings under its charter all of the land within the location lines of the canal. In the territory through which the former Monument River passes there are only four owners of land who had water frontage on the banks of the old Monument River, namely, Grover Cleveland's estate, Charles H. Taylor, Thirza A. Briggs, and the Cape Cod Construction Co. In the question of title to the Thirza A. Briggs parcel to the canal company, the deed conveyed all the riparian rights in the former Monument River, and the Cleveland and Taylor parcels, which were settled through condemnation proceedings, are fully conveyed, and the rights of the canal company to the use of the former Monument River is fully secured.

For full particulars of the rights of the canal company under its charter, reference is made to Exhibit O attached hereto, giving in detail the opinion of eminent counsel and cites the legal authorities.

EXHIBIT O.

OPINION OF EMINENT COUNSEL REGARDING RIPARIAN RIGHTS IN THE CAPE COD CANAL.

TITLES OF MESSRS. CADWALADER, WICKERSHAM & TAFT.

NEW YORK, *January 2, 1918.*

GENTLEMEN: We have given careful consideration to your letter of December 1, stating the question propounded to you in connection with a survey of the canal as follows:

"To what extent does the canal company own land adjacent thereto along the navigable portion of the former Monument River, and what protection exists by reason of such ownership of land as there may be against claims for free navigation, wharfage rights, or other demands arising from alleged riparian rights in that former river."

We have examined the map showing ownership along the canal, from which it appear that the only land not owned by you is that held by the Taylor, Cleveland, and Briggs estates, respectively. In the case of each of these three estates the amount of damages sustained by reason of the construction of the canal was determined by court proceedings, and the amounts so ascertained were paid and releases executed. There are no riparian rights under which free navigation, wharfage rights, or other demands may be enforced against the canal company. In this connection, we direct your attention to the case of Home for Aged Women *v.* Commonwealth, 202 Mass., 422.

Yours, very truly,

CADWALADER, WICKERSHAM & TAFT.

BOSTON, CAPE COD & NEW YORK CANAL CO.,
43 Exchange Place, New York City.

FEBRUARY 3, 1910.

DEAR SIRS: I have your Mr. Thorndike's favor of the 29th ultimo, relating to the property rights of the Cleveland and Taylor estates, which sets forth the legal aspects of the case with great minuteness.

I am aware that we would have to pay for the land taken. The amount of the land and the value of it are both small. The value of the riparian rights, however, probably will be very great. The practical question is this: Can we take the land and leave the riparian rights on the abutting shore to the present owners, either by the law of taking not forcing them on us, or by an arrangement with the counsel for both the estates that these riparian rights, if they have become invested in the canal company by automatic process of law, can be deeded back to the estates in question.

The owners are afraid if we own the riparian rights that we or our successors may erect great barriers of some sort, thus cutting off the physical connection of their land with the water.

The railroad commission has asked me to come to Boston on Saturday to discuss with them some work which they want me to take up at Springfield. My meeting with the commission is at 12 o'clock. I would be very glad to call at your office in the morning, say, at 10 o'clock to confer with you on this point.

Very truly, yours,

WM. BARCLAY PARSONS,
Chief Engineer.

MESSRS. STOREY, THORNDIKE & THAYER, *Boston, Mass.*

LETTER OF MR. J. L. THORNDIKE.

735 EXCHANGE BUILDING,
Boston, January 29, 1910.

DEAR SIR: Your letters of the 22d and 30th December to Mr. Palmer, with the maps referred to in the latter, relating to the riparian rights of the Taylor and Cleveland estates, at Buzzards Bay, have been handed to me, and I have considered the questions mentioned in them.

These two estates border the Monument River on opposite sides from the railway bridge to its mouth, a distance of about 3,000 feet, as shown on the part of one of the maps which I inclose. The titles of the owners of each estate extend to extreme low-water mark (Wonson *v.* Wonson, 14 Allen p. 82). The land below this limit belongs to the State. The location of the canal, 600 feet wide, runs between the two estates to extreme low-water mark at the mouth of the river, and includes land which is always covered by the tide and below the limit of private ownership, and also other land above that limit and partly below and partly above ordinary high-water mark.

As to so much of the land included in the location of the canal as is above the extreme low-water mark, there is no question that the canal company must pay the value of the land so taken. But it is stated that the land is in itself of little value, and the more important question is whether the owners of the two estates are by reason of the taking of their land excluded from access to the bay from the rest of their land, and thereby suffer other damages.

It is suggested in your letter that damages may not be payable on account of the loss of such riparian rights, because the waters below the railway bridge are navigable waters of the United States from which the owners of the two estates could not be excluded by appropriating them to the purposes of a canal solely by the authority of the State. The authority of the United States over this subject is derived entirely from the clause of the Constitution (1, 8) which empowers Congress to regulate foreign and interstate commerce, and navigable waters of the United States are only those waters over which "commerce of a substantial and permanent character" is conducted between the States or with foreign nations (Leovy *v.* U. S., 177 U. S., p. 632–634). As decided in that case, it is necessary that the waters should be at the time "substantially useful to some purpose of interstate (or foreign) commerce," and it is not enough that a boat might pass out of them to the sea (id. p. 634–635). Even in such navigable waters the authority of the United States extends only to interstate and foreign commerce, and everything else is subject to the control of the State (The Bright Star, 1 Woolworth 266, 275–278, by Miller, J.; The Daniel Ball, 10 Wall., p. 565). I infer from your letter that damages are probably claimed on the ground that access to the bay in small boats, not engaged in interstate or foreign commerce, may be taken away by the construction of the canal. I think it must be considered that the State would have authority to take any such rights, and that they would not be preserved by the laws of the United States.

By taking for the purposes of the canal the land included in the location the canal company acquired only as easement, and the title to the land itself remained in the adjoining owners as to so much of it as is above low-water mark, and in the State as to so much of it as lies below that limit. The adjoining owners could still as owners of the soil pass in boats over so much of the location as is above low-water mark, without committing any trespass, and as members of the public they could in like manner pass over the part of the location that is below low-water mark But the canal company would have the right to use for the purposes of their business the whole of the space included within the location and to exclude the owners of the soil and the

public whenever the exigencies of their business required it, and the canal company would be the judge of what the exigency required. This appears by such cases as Brainard *v.* Clapp (10 Cush., 6), and Whittemore *v.* New York, New Haven & Hartford Rld. Co. (191 Mass., p. 395). In the Canal act (1899, c. 448) authority is given to the company by s. 17 to establish for its own benefit a toll upon all vessels or water craft which may use the canal, and to regulate such use in all respects as the directors may determine. The canal company is thus authorized to impose a toll upon any boats of the adjoining owners or the public that pass over any part of the water included in the location and limit the times when they may so use it. By s. 18 a penalty is imposed upon any person who fraudulently evades or attempts to evade the payment of any toll. Consequently the adjoining owners could only pass over the part of the canal touching their estates by the sufferance of the canal company or subject to such tolls as might be established.

The act (1899, c. 448, s. 24) provides that—

"All persons whose land shall be taken * * * shall file * * * a written statement, setting forth substantially the quantity of land so taken and the amount of damages so claimed by them, respectively, for the taking thereof, and the county commissioners shall thereupon * * * determine and award the amount of damages to which such persons are entitled."

This is the only provision for any damages arising from the location of the canal, and it gives compensation only to persons whose land is taken, and only to the amount to which they are entitled for the taking thereof. No provision is made for compensation in the case of persons who sustain damages from the location of the canal otherwise than by having some of their property taken. Provision for such compensation is made in the statutes providing for damages caused by the location of railroads or the laying out of highways (Putnam *v.* Boston & Providence Rld. Co., 182 Mass., 351; Hyde *v.* Fall River, 189 Mass., 439); but there is no similar provision in the case of the canal. As in the case of the Charles River embankment (Home for Aged Women *v.* Com., 202 Mass., 422), under 1906 c. 402, s. 6, the only provision is that persons whose property is taken may have compensation therefor.

Accordingly, if the location of the canal had not included any of the land above extreme low-water mark, the owners of the adjoining land would not have been entitled to any damages under the act, for none of their land would have been taken. They would have sustained damage by being excluded from the water within the location of the canal below extreme low-water mark, by means of which they might have had access to the bay; but their right of passing over that water was one that they enjoyed only as members of the public and was not property of theirs. As the act does not give compensation for all damages caused by the location of the canal, but only gives it to persons whose land is taken for the taking thereof, the adjoining owners would not in such circumstances have been entitled to any damages (Home for Aged Women *v.* Com., 202 Mass., 422).

In fact, parts of the estates on both sides of the canal are taken, for the value of which as already stated compensation must be paid. If none of the space below the line of private ownership had been taken, the owners of the estate would by the taking of their property have been deprived of access to the channel at the places where it adjoins the parts taken. This would have been damage caused by the taking of their land, for which they would have been entitled to compensation. But the entire space below low water was also taken at the same time wherever it adjoined land that was taken from either of the two estates. The owners would not afterwards have had any right to pass over any part of that space if their own land had not been taken. They would not have been entitled to damages for the loss of that right for the reasons already given, as shown by Home for Aged Women *v.* Com. (202 Mass. 422). The taking of their land does not deprive them of access to the space through which the channel runs, for they have no longer any right to be there, even if they obtained access to it. The riparian right that formerly existed of passing over the water in that space and thence to the bay was taken away by an act independent of the taking of their land. In my opinion the owners of the two adjoining estates are not entitled to any damages on the ground that the location of the canal deprives them of the right of access to the channel of the river included in the location and of passing over it to the bay.

But I observe in your map that there is a continuous strip of land between high and low water skirting the shore on both sides from the railway bridge to the end of the canal at the mouth of the river. It may be that small boats could pass along this strip at high water and by this means go from any point below the railway bridge to the end of the canal without going into any water within the location below low-water mark. The owners from whom this strip is taken would have had a right to use it for this purpose if it had not been taken. They can not pass out of the Monument River on either side without going over the location of the canal, because the location

at the mouth of the river extends into the upland on both sides. If this right of going along the shore in boats above low-water mark would have been of any value, they are entitled to compensation so far as they are deprived of it by the taking of their land above extreme low-water mark.

I have indicated by a waving line in red ink on your map the space over which boats might have passed if their land had not been included in the location. They are entitled to damages for taking so much of this space as is included in the location. The location ends at the low-water mark at the mouth of the river and no rights are interfered with beyond that point.

Yours, faithfully,

J. L. THORNDIKE.

WM. BARCLAY PARSONS, Esq.,
60 Wall Street, New York City.

Question No. 20: What would be the present cost of constructing the canal as it stands as compared with the actual price paid for its construction?

Answer: Attached and marked "Exhibit P" is a statement of the cost of constructing the canal to-day as compared to the actual price paid for its construction. The figures in this exhibit were obtained from the contractors who constructed the various units comprising the canal.

From the estimates given by engineers and financial experts based upon present prices for labor and material, the item of excavation is considered very conservative and would undoubtedly be exceeded, for information given by William A. Oettinger, assistant treasurer of the Furst Clark Construction Co., Baltimore, Md., shows that a recent contract for the charter of one of their dredges was at the rate of $450, per day, as compared with the former price of $150 per day.

Mr. Harold S. Andrew, of the Maryland Dredging & Contracting Co., Baltimore, Md., stated that from his knowledge of the dredging work done at the canal by the Furst Clark Construction Co., and from conversations had with Mr. Frank A. Furst, he is convinced that the work done by them could not be duplicated or would not be undertaken unless for considerably more than $6,000,000.

The cost of construction of the canal amounted to $8,265,743.04, as shown on pages 2–6 of report of Price, Waterhouse & Co., marked "A" and accompanying report of survey on the Cape Cod Canal. It is estimated that the cost of constructing the canal as it stands would amount to about $11,572,040.26.

EXHIBIT P.

Statement showing cost of construction of Cape Cod Canal as it stands, compared with present estimated cost of constructing canal.

Particulars of cost.	Actual costs, 1907 to 1917.[1]		Estimated cost, 1918.[2]		Increases.	Per cent of increase.
Direct costs:						
Canal prism, including cost of rights of way for canal, railroad, and highways, excavation of canal prism, and protection of slopes	$4,783,086.57		$8,813,968.87		$4,030,882.30	84
Construction of breakwaters	504,076.66		853,880.00		349,803.34	68
Construction of bridges	521,088.85		978,650.56		457,561.71	88
Changes in railroad	190,463.72		327,130.68		136,666.96	72
Changes in highways	62,502.81		112,175.52		49,672.71	80
Equipment	181,993.71		335,647.47		153,653.76	85
Total direct costs		$6,243,212.32		$11,421,453.10	5,178,240.78	83
Overhead costs:						
Government and State inspection	38,194.93		38,194.93			
Engineering	422,131.46		675,410.33		253,278.87	60
Administration	504,510.56		504,510.56			
Preliminary surveys, engineering, labor, and expense	52,257.36		83,354.20		31,096.84	60
Organization and promotion	155,967.92		155,967.92			
Fiscal	375,000.00		375,000.00			
Legal	113,128.31		113,128.31			
Miscellaneous	18,265.02		18,265.02			
Income taxes	17,574.08				*17,574.08*	*100*
Traffic development	150,830.41				*150,830.41*	*100*
Total overhead costs		1,847,860.05		1,963,831.27	115,971.22	6
Interest:						
Paid during construction	2,119,216.61		2,966,903.25		847,686.64	40
Discount on securities sold	1,006,250.00		1,006,250.00			
Total interest and discount		3,125,466.61		3,973,153.25	847,686.64	27
Cost of charter, rights, etc		1,650,000.00		1,650,000.00		
		12,866,538.98		19,008,437.62		
Contingencies: Unsettled claims	(6.82%)	812,987.64	(10%)	1,900,843.75	1,087,856.11	134
Grand total		13,679,526.62		20,909,281.37	7,229,753.75	53

[1] As per certificate of Audit Co. of New York.
[2] Compiled from estimates attached by subcontractors who did work.

NOTE.—There is not included in above interest on $1,000,000 expended by the general contractor in the construction of the canal. At 5 per cent per annum the additional interest cost was about $450,000, increasing the total cost to $14,129,526.62 and the estimated present cost to $21,359,281.37.
Dated as of August 31, 1917.

Detail of estimates—covering "Direct costs" of construction—compared with actual costs, for the same work as performed by the same subcontractors, Cape Cod Canal.

Work done and name of subcontractors.	Canal prism.		Breakwaters.		Bridges.		Railroad.		Highways.		Equipment.	
	1907–1917	1918	1907–1917	1918	1907–1917	1918	1907–1917	1918	1907–1917	1918	1907–1917	1918
Hardware: Mitchell-Pappan Co		4									$517.69	$1,190.35
Royalty on bridge plans: Strauss Bascule Bridge Co					$4,500.00	$10,000.00						
Construction bridge fenders: T. A. Scott Co					6,991.34	12,560.00						
Excavation: Furst-Clark Cons. Co., Degnon C. C. C. Cons. Co	$2,830,695.84	$6,000,000.00										
Excavation arbitration: Furst-Clark Co	27,134.25											
Reconstruction dredge Federal, Furst-Clark Co	26,069.65	40,000.00										
Copper wire: J. A. Roeblings Sons Co											6,111.74	11,001.10
Hardware: Waterbury Co											749.98	2,520.00
Piles: J. A. Maloney & Co					5,442.40	11,910.21						
Temporary bridge: J. Livingstone & Co					1,468.08	2,936.16						
Royalty on bridge plans: Scherzer Lift Bridge Co					7,650.00	7,650.00						
Dry excavation: E. W. Foley Contracting Co	372,270.81	744,541.62										
Creosoted piling: Norfolk Creosoting Co											9,581.32	20,773.00
Piling for bridge fenders: Norfolk Creosoting Co					11,523.88	22,322.83						
Excavation: Metropolitan Dredging Co	120,210.81	204,358.57										
Road construction: W. A. Jones									$1,963.50	$7,170.00		
Steel wire: Am. Steel & Wire Co											1,778.87	3,654.80
Motor boat: N. Y. Yacht Launch & Eng. Co											2,573.43	4,000.00
Motor boat: Reuben Bigelow											2,477.48	4,000.00
Signals: Gen. Rway. Signal Co											1,468.54	2,937.08
Signals: Wetmore-Savage Co											3,254.94	5,221.14
Bridge foundations: Holbrook, Cabot & Rollins					73,787.46	118,059.66						
Trestle approach: Holbrook, Cabot & Rollins					11,400.00	22,800.00						
Bridge foundations: Holbrook, Cabot & Rollins					70,502.00	112,803.20						

Bridge fenders: Holbrook, Cabot & Rollins					4,375.00	8,750.00						
Temporary bridge: Holbrook, Cabot & Rollins					5,000.00	10,000.00						
Breakwaters: Degnon C. C. C. Cons. Co.; Degnon Contracting Co			503,472.00	852,680.00								
Rip-rap: Degnon C. C. C. Cons. Co.; Degnon Contracting Co	277,746.00	474,780.90										
Changes in railways and highways: Degnon C. C. C. Cons Co.; Degnon Contracting Co							87,704.25	165,271.10	17,480.03	27,274.20		
Bridge foundations: Degnon C. C. C. Cons.Co.; Degnon Contracting Co					51,579.31	82,732.50						
Painting railroad bridge: Geo. S. McLaurin					792.02	1,600.00						
Overpass Woods Hole: C. G. Ellis							2,929.79	5,859.58				
Painting fences: John Taylor									337.65	550.00		
Steel superstructure of railroad bridge: Pennsylvania Steel Co					98,330.85	200,200.00						
Trestle approach Bourne bridge: Pennsylvania Steel Co					19,405.00	40,000.00						
Superstructure (steel), Bourne bridge: Pennsylvania Steel Co					54,372.74	142,300.00						
Superstructure (steel), Sagamore bridge: Pennsylvania Steel Co					69,933.49	137,200.00						
Electrical work: Frd. T. Ley Co											8,661.12	17,350.00
Excavation: Standard Engineering Co	72,258.95	122,840.21										
Electrical supplies: General Electric Co											6,788.79	10,000.00
Highway construction: Wilson & English Con. Co					8,434.07	16,000.00						
Highway construction: Clarence Benson									3,595.50	6,500.00		
Macadamizing bridge app.: E. J. Rourke					476.30	950.00						
Excavation: Cape Cod Construction Co	450,612.18	566,040.70										
Railroad changes: N. Y., N. H. & H. R. R. Co							74,302.04	110,000.00				
Overhead bridge: Penn. Bridge Co									475.00	650.00		
Tug: Erie R. R. Co											50,000.00	95,000.00
Erection of dolphins: T. A. Scott Co. (Inc.)											12,937.97	25,000.00
Do											8,592.25	17,000.00
Do											6,669.00	13,000.00
Do											20,000.00	40,000.00
Electric power plant: S. E. Mass. Elec. Lt. & P. Co											6,500.00	13,000.00
Removing boulders: T. A. Scott Co. (Inc.)	66,170.09	111,489.09										

Detail of estimates—covering "Direct costs" of construction—compared with actual costs, for the same work as performed by the same subcontractors, Cape Cod Canal—Continued.

Work done and name of subcontractors.	Canal prism.		Breakwaters.		Bridges.		Railroad.		Highways.		Equipment.	
	1907–1917	1918	1907–1917	1918	1907–1917	1918	1907–1917	1918	1907–1917	1918	1907–1917	1918
Changes in trolleys: New Bedford & Onset Ry. Co.							5,826.68	8,500.00				
Miscellaneous labor and material: Cape Cod Construction Co.	10,905.10	20,000.00	604.66	1,200	1,915.48	3,800.00	14,997.47	30,000.00	12,145.90	24,000.00	33,330.59	50,000.00
Underpass Bournedale: Cape Cod Construction Co.							4,703.49	7,500.00				
Clearing location: Cape Cod Construction Co.	1,455.55	2,000.00										
So. app. fill, Sagmore Bridge: Cape Cod Construction Co					1,551.41	2,000.00						
No. app. fill, Sagmore Bridge: Cape Cod Construction Co					1,082.02	1,500.00						
Collins Farm Road, no. ext.: Cape Cod Construction Co									681.02	1,000.00		
Temporary road, Bournedale: Cape Cod Construction Co									833.55	1,250.00		
Monument River spillway: Cape Cod Construction Co	639.56	1,000.00										
Surfacing new highway: Everett E. Berry									400.00	600.00		
Collins Farm Highway: E. W. Foley Cons. Co.									21,590.66	43,181.32		
Rights of way settled by purchase or condemnation	526,917.78	526,917.78			10,576.00	10,576.00						
Grand total	4,783,086.57	8,813,968.87	504,076.66	853,880.00	521,088.85	978,650.56	190,463.72	327,130.68	62,502.81	112,175.52	181,993.71	335,647.40

Question No. 21: What would be the annual saving to our maritime interests if all the tonnage at present rounding the cape used the canal, assuming it to be deepened to 35 feet and correspondingly widened with proper provision for passing.

Answer: Taking as a basis the fact that unless there is an actual saving coastwise commerce would not use the canal, and assuming that the cost of operating vessels around Cape Cod (which would be avoided by the use of the canal) would be at least equal to the amount paid for tolls, it is fair to conclude that if the canal were widened and deepened and made a toll-free canal under Government auspices that the saving per annum would be equal to the amount of tolls paid and the actual amount saved in addition thereto. On 25,000,000 tons per annum this saving would be equivalent to approximately 10.5 cents per ton, or $2,624,000. In addition to the monetary saving to commerce, there would be the further benefit from the lessened risk and the resultant decrease in loss of life and property, and in the cost of insurance.

If the canal were widened and deepened it would not be necessary for the Government to dredge the Pollock Rip Channel. It is understood that the Government's estimate for doing this work is approximately $500,000. Reference to the chart will show that there is another channel from Vineyard Sound to the eastward and there is good authority for believing that the Pollock Rip Channel can not be maintained without large annual expense.

Qustion No. 22: What is the tonnage of coal now shipped around Cape Cod annually, and what loss is there per ton and in total arising from delays by reason of weather conditions of all kinds, and loss from wrecks. In this connection it should be learned whether in addition to saving such loss there would be further gain from making more trips per annum by reason of reduced distance and greater mobility, or by the substitution of less powerful tugs from the southern entrance of the canal to Boston for the large ocean-going tugs used outside Cape Cod.

Answer: The total tonnage of coal received by New England for 1916 was approximately 11,422,439 tons. Taking as a basis the approximate saving of all the elementary advantages accruing to commerce using a widened and deepened canal as against the present outside route, of approximately 10 cents per ton, the amount saved per annum on the above tonnage would be approximately $1,142,243.90. The cost of operating coal barges is governed largely by restrictions and the laws of the Department of Commerce requiring crew equipment for coastwise vessels. With the canal widened and deepened the economies in equipment and crew can be established, due to the lessened risk and a safer route, effecting a further saving than shown above.

Testimony was given at a hearing before the Senate committee by J. C. Reichert, representing the New York boat owners and the New York Tow Boat Exchange (Exhibit I) that James Hughes, jr., 1 Broadway, New York, a small shipper of coal, showing that since the opening of the canal during a period of nine months, there was transported to Boston 124,903 tons of coal in so-called "boxes," which heretofore had never gone further east than Providence, they being strictly inland water carriers. The cost of operating a box is considerably less than the operation of a barge, and the capital cost in nominal times of a box is approximately $8,000 as compared to $30,000 for a barge.

Under favorable conditions it is estimated that a tug and three coal barges can make the trip around Cape Cod in 42 hours, as against 28 hours through the canal, a difference in the one-way passage of 14 hours. From the statement made by Capt. J. M. Cherry, superintendent floating equipment, Lehigh Valley Railroad, tows have made an average of 2 trips per month in the summer and 1½ trips per month in the winter, making a total average of about 21 trips per annum.

The maximum number of trips possible and the actual running time outside Cape Cod would be per annum 203, as against 315 trips through the canal, a gain of 107 trips under the most favorable conditions; an average of two days per trip, the equivalent of 214 days. Deducting, however, delays on account of weather outside Cape Cod as shown by the statement of Capt. Cherry, would leave 121 days gain by using the canal equivalent to about 60 single trips, or 30 round trips. The remaining time consumed as shown by actual experience is due to the time at the terminals for loading and unloading. It is fair to assume, therefore, that if the canal were widened and deepened and made available for the accommodation of all traffic, a gain in the number of trips would average at least one-half of the figures shown above, viz, 30 single trips per annum or 15 round trips. The effect of this saving would be that with the same equipment as at present about 50 per cent more coal could be transported in the same time, but at a lessened expense by using the canal.

With the canal widened and deepened and made available for all traffic, an extension of the present methods of towing companies could be established. It is the practice at present for the Boston Tow Boat Co. and others to pick up tows with their small tugs at Buzzards Bay and Sandwich (which tows are dropped by

the large ocean-going tugs bringing barges from coal ports) and towing them to their destination. With a fleet of small tugs to do the towing between the canal entrance at Wings Neck, Buzzards Bay, and Boston, the use of large ocean-going tugs could be confined to the problem of towing barges from Norfolk, Philadelphia, and other coal ports to the canal entrance. A suitable anchorage is available in Buzzards Bay, in sheltered waters, and the ocean-going tugs could leave their tows there for the small tugs to take to destination, thus adding to the efficiency of the fleet of ocean-going tugs and utilizing the smaller tugs to their fullest capacity in service for which they are best suited. It has been the practice to take tows of three barges to Boston, where they were broken up and distributed to the different ports along the coast by smaller tugs. By making Buzzards Bay the point of distribution instead of Boston, much valuable time can be saved, and it would also add to the capacity of Boston Harbor for the handling of ocean-going freights. It is an undisputed fact that the congestion of freight in Boston Harbor at the present time is a question receiving the serious attention of the port authorities.

The extreme severity of the weather of the present winter and the shortage of coal in Boston and New England further emphasizes the necessity of a canal at Cape Cod capable of accommodating all types of commercial vessels. Dangers of the outside route would be eliminated and greater mobility secured. The loss of time from storm and fog on the outside route is shown in other paragraphs, and will always exist. The possible danger from an enemy attacking from the sea will be much lessened if the canal is available for all commercial and naval vessels. The Shipping Board and the Department of Commerce have recognized at various meetings the necessity of providing the people of New England and the industries connected with manufacturing war supplies with the prompt delivery of coal at all seasons of the year. The saving in time alone during the present abnormal conditions and the furnishing of coal for heating purposes to the people of New England are paramount factors from the standpoint of efficiency of protection for national and State defense.

APPENDIX E.

Fog record.

Year.	Hours of fog at—		
	Wings Neck Lightship.	Bird Island Lightship.	Plymouth Lightship.
1910[1]	423	112	635
1911	641	122	775
1912.			
January	21	19	116
February	(2)	(2)	18
March	74	62	99
April	43	22	68
May	98	51	131
June	40	20	1
July	89	44	52
August	17	10	61
September	8	5	9
October	6	11	13
November	13	34	32
December	64	82	49
Total	473	360	649
1913.			
January	85	104	55
February	55	55	57
March	127	132	111
April	38	38	110
May	57	70	65
June	51	53	25
July	12	21	39
August	7	17	49
September	8	19	61
October	81	93	185
November	10	17	18
December	8	23	13
Total	539	642	788

[1] Only records available are totals for the year.
[2] No record kept; bell not sounded.

Fog record—Continued.

Year.	Hours of fog at—		
	Wings Neck Lightship.	Bird Island Lightship.	Plymouth Lightship.
1914.			
January	16	76	70
February	26	59	97
March	48	62	100
April	16	19	65
May	16	24	76
June	7	12	16
July	85	83	109
August	76	47	95
September	10	11	3
October	28	31	42
November	4	11	21
December	59	55	77
Total	391	490	771
1915.			
January	82	91	61
February	24	33	66
March	.....	3	2
April	71	52	72
May	37	27	10
June	77	99	129
July	58	59	99
August	28	16	73
September	62	46	22
October	30	40	11
November	13	14	11
December	31	41	24
Total	513	521	580
1916.			
January	56	70	27
February	108	94	113
March	100	64	116
April	19	23	42
May	68	72	89
June	62	54	101
July	74	98	112
August	35	43	99
September	34	44	59
October	33	38	40
November	6	9	9
December	53	46	35
Total	648	655	842

STATEMENT MADE BY MR. J. J. COAKLEY, TREASURER OF THE CAPE COD CONSTRUCTION CO., BEING A SHORT SYNOPSIS OF THE NEGOTIATIONS AND TRANSACTIONS BETWEEN MR. DE WITT C. FLANAGAN AND THE CAPE COD CONSTRUCTION CO.

In the early part of 1905 Mr. De Witt C. Flanagan opened negotiations with August Belmont & Co., the bankers, with the object of having them finance and promote the construction of the Cape Cod Canal. He offered in consideration of the delivery to him of $500,000 in bonds and $2,400,000 of stock of the canal company to turn over all of his rights, title, and interest and franchise to the canal company, together with titles to lands owned or held by him under option within the vicinity of the canal. According to Mr. Flanagan's own statements, he had invested about $675,000 cash in the enterprise up to this time.

The first definite agreement was entered into between the two parties on the 21st of February, 1906, in which it was provided that Mr. Flanagan was to receive the above securities in consideration of his rights and titles to real estate, also the return to him of $200,000, which had been deposited by him with the Treasurer of the Commonwealth of Massachusetts under the charter. This agreement was not carried out and expired by limitation.

In January, 1907, a new agreement was entered into in which the amount of bonds was reduced to $250,000, the stock remaining $2,400,000. When attempts were made to secure underwriting to the remaining securities of the canal company, these amounts were found to be excessive by prospective underwriters, and this negotiation could not be carried through to a conclusion. Therefore, in May, 1907, as a necessary step

to insure the financing, Mr. Flanagan surrendered $400,000 of the stock to come to him and new agreements were entered into whereby he was to receive $250,000 of bonds and $2,000,000 of stock.

It was on this basis that the negotiation was concluded and carried through to the completion of the work. During the progress of the prior negotiations, Mr. Flanagan and August Belmont & Co. had agreed that, for the services of August Belmont & Co. in financing the project, Mr. Flanagan was to turn over from his $2,400,000 of stock, $1,000,000 of stock to August Belmont & Co. This $1,000,000 afterwards was reduced to $600,000 by reason of the surrender by Flanagan of $400,000 of his $2,400,000. When the time came to deliver the stock to Flanagan, he turned over to August Belmont & Co. the $600,000 above mentioned, and August Belmont & Co. voluntarily turned this $600,000 back into the treasury of the Cape Cod Construction Co., as shown by the minutes at the time.

A brief history of the former interests acquired by Flanagan, and in turn conveyed by him to the Boston, Cape Cod & New York Canal Co. through the Cape Cod Construction Co., would be as follows:

First period (1883–84).—The route of the canal in 1883 was the same as it is now (1918), the western end following the course of the Monument River. The Cape Cod Ship Canal Co. incorporated with the following officers: President, Col. William Seward, jr.; vice president, Mr. Samuel Fessenden; clerk, Mr. Willard Howland; chief engineer, Mr. George H. Titcomb; assistant chief engineer, Mr. George W. Wright; engineer, Mr. Charles M. Thompson.

The Lockwood charter, so-called, was granted June 26, 1883. Frederick A. Lockwood, of East Boston, was assisted financially by Quincy A. Shaw, of Boston, and about $1,500,000 was spent under this charter.

The dredging under Lockwood charter was done between the years 1884 and 1888.

Purchases of land made in the name of the Cape Cod Ship Canal Co. included 27 parcels of land, title to which has been transferred and now rests with the present Boston Cape Cod & New York Canal Co. and Cape Cod Construction Co.

Second period (1887–1890).—A new route was laid out with the canal emptying into Buzzards Bay by way of Back River. The officers were as follows: President, Mr. William A. Clark; treasurer, Mr. Samuel Fessenden; clerk, Mr. Willard Howland; counsel, Mr. Samuel W. McCall; engineer in charge, Mr. Charles M. Thompson; contractors, Mr. F. A. Lockwood, Messrs. Smith and Ripley.

Titcomb and Lockwood had a disagreement and Lockwood contracted to build the canal, subscribing for all the capital stock of the company. Samuel W. McCall bought a large part of the right of way, title being in the name of the canal company. Lockwood also bought a large number of parcels. The Back River route was surveyed; and included in the lands purchased were 65 parcels, title to which rests at the present time with the Boston, Cape Cod & New York Canal Co. and Cape Cod Construction Co.

Third period (1890–1899).—Charter of the Back River route prevailed until March 22, 1890, when Thomas L. Livermore forced Lockwood into an assignment (book 189, p. 286) to him of all his right, title, and interest. Livermore was acting as trustee for Quincy A. Shaw, who never appeared in any official capacity, being always represented by Livermore. All claims possible were settled. Livermore got everything into his hands and took titles to pieces of land where he could get them; where there were claims for damages they were tried out and settled, and he turned everything over to the Cape Cod Construction Co., who settled these claims for Thomas L. Livermore. Nothing further was accomplished, but everything brought to a focus, and an order was granted from the court authorizing Livermore to straighten out the entire transaction. In most cases, pieces of land were taken out in the name of Thomas L. Livermore. All parties interested were brought into court and Livermore was ordered to make sufficient allowance to cover all expenses and then the entire project was left until such time as further progress could be made. Fifty-two parcels of land, title to which now rests with the Boston, Cape Cod & New York Canal Co. and Cape Cod Construction Co., were bought in the name of Thomas L. Livermore.

Fourth period (1899–1907).—Boston, Cape Cod & New York Canal Co. chartered June 1, 1899, by a new charter from the Commonwealth of Massachusetts. Incorporators: Alexander Dow, David W. Belding, Charles E. Hoge, Richard G. Peters, Thomas F. McGarry, Walter Clifford, Charles H. Phelps, De Witt C. Flanagan, William O. Brown, Charles M. Thompson.

This is the charter under which the canal has been constructed and completed. De Witt C. Flanagan did not have any official position except as a director, but land purchased by him was taken in his name for the canal company and remained vested in him until the organization of the Cape Cod Construction Co. in 1907, to whom he conveyed all titles owned by him and options secured by him from Thomas L. Livermore.

A brief analysis of the real estate purchased during the various periods covering the history of this canal, title to which now rests with the Boston, Cape Cod & New York Canal Co., and the Cape Cod Construction Co., would be as follows:

	Acres.
First period, Cape Cod Ship Canal Co	142.57
Second period, Cape Cod Ship Canal Co	592.30
Third period, Thomas L. Livermore	267.46
Fourth period, De Witt C. Flanagan	78.713
	1,081.043
Fifth period, Cape Cod Construction Co	484.24
	1,565.25

This is approximately the total area of land owned by both the Boston, Cape Cod & New York Canal Co., and the Cape Cod Construction Co., at the present time, from which it will be seen that about 70 per cent of the total area was acquired from De Witt C. Flanagan by purchase or through his options with Livermore. The Cape Cod Construction Co. expended up to August 31, 1917, a total of $537,493.38, included in which was $160,242.77, paid to Livermore by the Cape Cod Construction Co., leaving $377,251, representing the approximate cost of 30 per cent of the right of way and lands necessary for the construction of the canal, change of railroad, change of highways, and for spoiling land, etc. Applying this percentage of cost to the lands acquired from Flanagan and Livermore, the remaining 70 per cent of the right of way would have cost $875,000, of which the Cape Cod Construction Co. paid to Livermore $160,242.77, so that the remainder of $715,000 represents the approximate value of the Flanagan real estate and rights of way delivered by him as part of the consideration for the payment to him of $1,400,000 of stock and $250,000 of bonds. The remaining equity in these securities will be the only return to Flanagan, against his original net investment of about $475,000.

As owners of 70 per cent of the right of way, Livermore and Flanagan were entitled to damages for land taken for canal and changes in railroad and highways. If prosecuted through condemnation proceedings, this major portion of the land required would undoubtedly have cost the Cape Cod Construction Co. greatly in excess of $875,000.

Dated May 1, 1918.

CAPE COD CONSTRUCTION CO.,
By JOHN J. COAKLEY, *Treasurer.*

Statement by Boston, Cape Cod & New York Canal Co., showing operating expenses, including maintenance, from Apr. 10, 1916, to Apr. 30, 1918. (*See also App. A, p. 40.*)

	16⅔ months, from Apr. 10, 1916, to Aug. 31, 1917.		8 months, from Sept. 1, 1917, to Apr. 30, 1918.		For the month of April, 1918.
	Amount.	Monthly average.	Amount.	Monthly average.	Amount.
Railroad bridge	$13,806.58	$828.37	$6,700.77	$837.59	$780.00
Highway bridges (2)	15,806.35	948.37	5,643.58	705.44	743.85
Launches	16,551.44	993.27	5,727.67	715.96	616.42
Lighting of canal	7,366.78	442.00	3,055.48	381.94	392.99
Maintenance, canal prism	62,145.60	3,728.72	25,559.46	3,194.94	55.22
Riprapping of banks	10,152.43	609.13	41.48	5.18	.....
Mooring dolphins	3,344.37	200.65	118.50	14.81	.....
Miscellaneous maintenance	3,720.25	223.20	1,583.85	197.98	233.06
Ferry	6,971.06	418.25	2,963.10	370.39	340.00
Repair yards	11,644.89	698.68	4,246.00	530.75	324.55
Signals	1,036.20	62.16	734.09	91.76	90.00
Engineering maintenance	7,260.33	435.61	6,231.90	778.99	751.25
Toll collectors and pilots	8,653.87	519.22	3,622.50	452.81	464.50
Tug service, general operating expenses	93,184.91	5,591.08	7,813.32	976.66	.....
Administration expenses at canal, including superintendent's salary, office staff, and office expenses	19,240.81	1,154.45	11,071.61	1,383.95	1,513.99
General administration expense, including salaries of general officers, legal expense, advertising and publicity, office rents and expenses at New York, services of fiscal agents	101,540.41	6,092.42	58,034.14	7,254.28	5,666.73
	382,426.28	22,945.58	143,147.45	17,893.43	11,972.56
Taxes	2,253.50	135.21	2,018.00	252.25	450.00
Insurance	13,606.22	816.37	7,440.00	930.00	930.00
Accidents and damages	8,813.24	528.80	584.15	73.02	.....
Grand total	407,099.24	.....	153,189.60	.....	13,352.56
Monthly averages	.....	24,425.96	.....	19,148.70	13,352.56

HEARING BEFORE THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS IN REFERENCE TO WATERWAY CONNECTING BUZZARDS BAY AND CAPE COD.

[Preliminary examination called for by act of Aug. 8, 1917.]

APRIL 23, 1918—10.50 A. M. TO 1.30 P. M.

Present: Maj. Gen. Peter C. Hains, Brig. Gen. William T. Rossell, Brig. Gen. Frederic V. Abbot, Col. S. W. Roessler, Col. W. L. Fisk, and Col. Henry C. Newcomer, members of the board.

The following-named gentlemen appeared before the board in reference to the above subject: Maj. August Belmont, president of the Cape Cod Canal Co.; H. P. Wilson, vice president of the Cape Cod Canal Co.; H. T. Campion, of the engineering and auditing firm of Paine, McClellan & Campion, of New York; J. J. Coakley, treasurer of the Cape Cod Canal Co.; Messrs. Bell and Mole, of the Audit Co. of New York; W. J. Douglas, of Barclay, Parsons & Klapp, engineers, New York; Mr. Marr, of Price, Waterhouse & Co., New York; and Charles H. Innes, of Boston, Mass.

STATEMENT OF MAJ. AUGUST BELMONT.

Maj. BELMONT. Gentlemen, I do not come here officially, but because I thought it was due you that I should, as president of the canal company, convey to you the appreciation of the company of your readiness to give the company a hearing in this matter.

Personally, I have been in the service for six months, and consequently I am not familiar with what has been done by the company. I am not in active control of the company, although I did not resign my position with it at the time I received my commission in the Army.

We were approached by the Government with regard to the purchase of the canal about 18 months ago. The Secretary of the Navy sent for me and asked me for information with regard to it, and I gave him such as I had; that information was followed afterwards by a brief. Those interested in the company have not sought a sale of the property, because when we started to build it we felt, and we feel to-day, that it is a valuable property and that in the course of time it will respond to the expectations we have had of it. I feel it due my associates to say to you that we have not changed our minds with regard to that, notwithstanding the fact that conditions in the coastal traffic have been abnormal and the development of business has not been such as would have taken place if normal conditions had prevailed. When a certain view was expressed with regard to what the property was worth, and what it had cost, we felt that we should have the privilege of explaining the matter to you, and I wish to state that we appreciate your courtesy in permitting us to do so.

I am not sufficiently familiar with it to present the matter to you, so we have brought here an expert accountant and an auditor who will explain to you whatever you desire to know. I will therefore surrender my place to them. I am sorry that I am unable, as president of the company, to respond personally to whatever you may ask, but, as I say, my duties have been such that I have not been able to personally keep in contact with the company. I have been sent abroad, and I am here on detached duty, and I really do not have time to attend to it any more. However, I felt it due you that I should personally appear before you and convey to you our appreciation of your willingness to hear us.

Mr. WILSON. With your permission, I will ask Mr. Coakley, treasurer of the company, to explain certain items entering into the cost of the canal, as indicated by our books and the findings of the accountants. I will ask Mr. Coakley to bring these matters briefly to your attention.

STATEMENT OF MR. J. J. COAKLEY, TREASURER OF THE CAPE COD CANAL CO.

Mr. COAKLEY. Gentlemen, in the report of the auditors, Price, Waterhouse & Co., they have segregated the costs as they found them, so as to show first the total direct cash cost, which is shown here as $8,265,743.04. That includes, as they point out, direct cost, indirect cost or "overhead," and interest during construction, to July 30, 1914, only.

They have not included in their figures the amount paid in capital stock and bonds for rights, franchises, etc., or for services in the promotion and organization of the enterprise, or for engineering and financing, or discount on securities issued, or any portion of the loss or deficit on operations or damage claims pending.

Certain payments in capital stock were charged in the books as follows:

"William Barclay Parsons, $100,000.

"J. B. McDonald, $250,000, for services, and

"August Belmont & Co., $50,000, for services in financing."

If you will permit me to go ahead in my own way I will try to explain just what these three particular items covered.

I will state, in reference to the $100,000 of stock paid to Mr. Parsons—who is now Lieut. Col. Parsons, in France—that at the time actual work commenced in July, 1905, compensation for his service was paid to him by the company. At that time he had been employed, with his staff of engineers and his field engineers, on survey work and development on the ground at the cape. He had a force of engineers there, he supervised the preparation of the plans and survey of the property, and his compensation had not been settled until July of 1909. He asked for a certain amount of money per annum to pay him for his future work and for his past work, and in settling the terms of his compensation the company fixed the cash basis at $20,000 a year and the rest of it was to be paid for by this $100,000 stock. That is not all he asked for, but that is all he got. That $100,000 was in lieu of the cash for which he asked.

The CHAIRMAN. That was in stock?

Mr. COAKLEY. In stock, for his services and the services of his engineering staff in New York and for general supervision of the construction work at the cape.

Col. FISK. Did he pay for all the work that was done on the survey himself?

Mr. COAKLEY. No, the company paid that.

Col. FISK. And only his New York expenses were included in the $100,000? Is that the idea?

Mr. COAKLEY. That was for his work at the cape and general supervision of the entire contract.

Col. FISK. Did the company furnish the assistants and all that sort of thing?

Mr. COAKLEY. He had a field force at the cape.

Col. FISK. Which he was paying himself, or was the company paying for that?

Mr. COAKLEY. The company paid that.

Col. FISK. I was wondering if that was included in the $100,000.

Mr. COAKLEY. No; the $100,000 was the consideration given him in lieu of what he asked for, which the company felt they could not give him, and they settled his claim with this stock for $100,000.

The CHAIRMAN. And he received $20,000 besides?

Mr. COAKLEY. Yes, per annum.

The CHAIRMAN. For how many years?

Mr. COAKLEY. That ran from 1909 to 1916, when he surrendered his position as chief engineer and his connection ceased, so that the $100,000 was spread over a period of seven years, in addition to the cash compensation he received.

Gen. ABBOT. $240,000 would be the total compensation he received, including the stock, if the stock sold for anything like par?

Mr. COAKLEY. It would be about that. That covered not only his services, but the services of his deputy, Mr. Douglas, of his entire staff in New York, his draftsmen, his consulting advice, etc., and all of that work as chief engineer of the company.

Gen. ABBOT. But not the field force, the surveyors, the transitmen, the rodmen, etc.?

Mr. COAKLEY. No, sir. They were on the pay roll of the company.

The next item of $250,000, which is here charged against administration, was paid to Mr. J. B. McDonald, who is now dead. Mr. McDonald had been, from the inception of the enterprise, the contractor and a vice president of the company. He was engaged to supervise the contracting end of it as a man of large experience and having been associated with our people in the construction of the New York subway. He was, of course, a man of international repute, and his connection with the Cape Cod Canal enterprise naturally gave it much standing. He was for four years our vice president and general manager in charge of construction. His advice as to ways and means of constructing the canal was valuable during those four years. He was engaged on a basis of $25,000 a year's salary and a promise of $250,000 in stock besides.

The project dragged along for four years and on account of financial conditions at the time it was impossible to go into the actual construction. That was in 1907, when we had the financial panic. It was impossible to start work on any enterprise at that time. Mr. McDonald was ambitious, he was anxious to go ahead with the work, and finally he drew out of the company. When it came to settle with him there seemed to be some complications in regard to his compensation. He wanted $100,000 in cash, and the stock which had been promised him. The company finally compromised with him by having him surrender his claim for cash compensation and take only the stock in payment for his services in cooperating, assisting, and advising as to ways and means of construction, which covered a period of four years of practical work in connection with the enterprise.

Col. FISK. He received no cash?

Mr. COAKLEY. No cash. He surrendered his claim for cash, and was satisfied to receive this amount of stock. It was a compromise settlement.

Gen. ABBOT. If this is an unfair question you need not answer it, but at the time that agreement was made what would be the value of the stock received?

Mr. COAKLEY. That never was brought up. We had always considered that stock at par. There has never been a market value for it.

Gen. ABBOT. If Mr. Parsons took that stock at par his compensation was $240,000?

Mr. COAKLEY. That would be the effect of it, yes; for about seven years' work.

The next item is $50,000 to August Belmont Co. I am fairly familiar with the compensation received by August Belmont Co. for promoting the enterprise, and that is the only amount that appears anywhere as compensation to them. That was for a particular service. At the time this payment was authorized the company had practically exhausted the cash which had been raised at the first financing of it, and it was necessary to raise the balance by loans. The loans were arranged through the New York banks and were secured by collateral in the shape of bonds and stock of the canal company owned by the construction company at that time. To secure the money it was necessary to have the notes of the construction company guaranteed. August Belmont & Co. indorsed and guaranteed them, and for that service they were paid this amount of $50,000 in stock. That was to cover not only the present time, but until the completion of the work.

The CHAIRMAN. You spoke of the construction company.

Mr. COAKLEY. The parent company, or the charter company, was the canal company. That company entered into a contract in 1907 with the Cape Cod Construction Co.

Col. FISK. That is, itself, under a different name?

Mr. COAKLEY. Not exactly; in the main possibly so, yes; but not exactly, because there were different interests in one company from those in the other. The canal company had people interested in it that were not interested in the construction company at all, so that for all practical purposes they are separate entities.

Gen. ABBOT. But with considerable interlocking?

Mr. COAKLEY. There was some, yes. As a general thing you can take it as one family, but not exactly so from the legal standpoint. To make that clear to you, when the construction was finished, the active board of the construction company turned over into the active board of the operating company, which was practically the canal company.

I think that covers these three items of payments in capital stock which appear on page 4 of the report which cover the cost of the franchise. Price, Waterhouse & Co. clearly state, on page 5:

"We have reference hereunder not only to the amount of $400,000 paid to the engineer and others, as hereinbefore stated, but also to certain payments in stock and bonds to DeWitt C. Flanagan under the syndicate agreement dated May 28, 1909, which provided that of the canal company stock to be received by the construction company there was to be delivered 33⅓ per cent to DeWitt C. Flanagan, the original promotor of the enterprise, for assignment (as the agreement recites) of: All of his rights to the canal company and against the delivery to the construction company of all the capital stock of the 'Cape Construction Co.' and the ownership or muniments of title to the property and franchises of the canal company, together with all options for land and rights of way appurtenant to the canal as projected, and all real property owned and acquired by the said Flanagan along the line of the said canal, and all property and all maps, plans, papers, and documents appertaining to the said enterprise."

The Cape Construction Co. is not the Cape Cod Construction Co. The Cape Construction Co. was a corporation organized to construct the canal before we came into the enterprise at all. It was a corporation incorporated under the laws of New Jersey, the entire capital stock of which was surrendered by Mr. Flanagan when he entered into his negotiations with the present interests.

Gen. ABBOT. That was a step to clear title and get started?

Mr. COAKLEY. Exactly. All of the rights of the Cape Construction Co. are vested now in this company. Those rights date back to 1883. Part of the right of way to the actual canal which he owned was acquired by previous interests back as far as 1883 and, by processes of law, it had gradually simmered down until when we came into the enterprise we assumed and took over all of the property of the canal to-day. Three different enterprises were engaged on the canal, one in 1883, one in 1889, and one in 1899, and we came into it in 1907.

Gen. ABBOT. That property covers certain land or real estate outside of the limits of the right of way of the canal itself?

Mr. COAKLEY. Yes. A part of the land used for spoiling, for railroad changes, changes in highways, and various purposes. We had to change the railroad; we had to change the private highways. A lot of this land which he turned over was used for that purpose, but a good deal of it was for the right of way of the canal.

Gen. ABBOT. In acquiring that land did not Mr. Flanagan have to get larger areas than he required in some cases for the canal, in order to close the deal with the owners?

Mr. COAKLEY. Yes, it was a case of all or none; I think there were people along the line of the canal whose families had owned land for generations and part of that land was needed for the canal right of way. It often happened, as you will see by the blueprints, that a small parcel of land would be bisected by the right of way with a portion outside and the rest inside. The company could take the portion that was inside by condemnation, but to proceed to condemnation would involve, in many cases, an expenditure of more money than the land was worth. It was cheaper to buy the entire parcel and get a deed for it, which we did in many instances. I think there are deeds for the entire right of way, covering probably 80 per cent of it at any rate, and the rest of the land was taken by condemnation proceedings through the Massachusetts local commissions, commissions which were appointed to sit in those cases.

Capt. WEBER. Don't you have a fee simple title if you get it by condemnation?

Mr. COAKLEY. Yes; we have the right of eminent domain with respect to those condemned parcels, so there is no question about the title to the land. The land is ours as long as the canal company exists and as long as the land is used for canal purposes. We took those parcels for canal purposes by our right of eminent domain through condemnation, and the damages have all been settled and paid for. Deeds are in the name of the canal company for all of the right of way to-day, conveying title to those parcels which we acquired by title deed and conveying title by right of eminent domain for those parcels we acquired by condemnation.

In addition to the rights and franchises conveyed by Mr. Flanagan he also conveyed to us his options for land and rights of way pertaining to the canal as projected, and all of his documents. He had a great many valuable—in fact invaluable to us—plans, maps, and documents. Everything was provided for. He had undoubtedly incurred large expenditures, and the amount paid to him net for all those things was $1,400,000 in stock of the canal company and $250,000 in bonds of the canal company. But he did not get any cash that he had spent back. That was to cover all of his rights and the rights of anybody associated with him and which were to be turned over to the Cape Cod Construction Co.

I believe he inherited the enterprise. He had gone into it originally with his brother, William L. Flanagan, and with a number of other people. He had of course to pay his lawyers, his accountants, his engineers and laborers, and by acquiring the option on the land owned by the last organization that had tried to build the canal we were in the position of having secured through him practically 70 per cent of all the land that we needed for the canal right of way. An option was gotten from Thomas L. Livermore and we have maps in New York in detail showing just exactly how many parcels were conveyed in that option, which we took up and paid for. We paid Livermore $160,000 for the land that was owned by him and upon which Mr. Flanagan had an option. That $160,000, if I recall correctly, covered 350 different parcels of land that Mr. Livermore had acquired from time to time through previous charter organizations. Through a sheriff's sale in 1891, when the Cape Cod Ship Canal Co. was liquidated, he acquired direct title to all of that land. He had given an option on it to Flanagan and Flanagan turned it over to us. We took the option up and paid Mr. Livermore $160,000. I think the amount was one hundred and sixty-odd thousand dollars, and we paid him that in cash. That is a part of the present cost of the right of way, of the land, and land damages.

Gen. ABBOT. When you got the right of way, as I understand it, you acquired enough so that there is nobody bordering on the canal now, or on the canal when it is widened, who will obtain riparian rights which will permit them to interfere with the operation of the canal by utilizing such frontage against the interests of the canal company?

Mr. COAKLEY. I see your point, Gen. Abbot. I think there is only one party along both banks of the canal, for the 16 miles of frontage, that has any riparian rights. The reason for that is that his low-water land extends beyond the right of way line of the canal. That is on the south bank near Bourne. It is a small parcel and we had that question thrashed out thoroughly. This party claimed he had the right to enter the canal and we claimed that he did not and we proved to him that he did not; but we can not prevent him from entering on his low water land at the front of his own land. To get into and upon the canal right of way he will have to pay tolls to the canal company. That is the only case that I know of. The right of way is sufficiently wide at the present time, 1,000 feet at the eastern end and 600 feet minimum the rest of the way, to permit of the widening and deepening of it, except possibly in the high elevation there from Bournedale, where there may be a slight deficiency in width when it comes to widening the canal, but that will not be a serious matter.

Gen. ABBOT. So if the United States acquires the canal there will be no possibility of trouble arising over riparian rights?

Mr. COAKLEY. We can not see how trouble can arise, because we had that question thoroughly thrashed out by counsel. One of the provisions of the charter of the canal company, granted by the State, was that all claimants for damages for rights of way taken by the canal company should file their claims for damages and have them passed upon by the board of county commissioners; that after hearing, when damages were assessed, the canal company must pay them. We have paid them, and have absolutely settled that question once and for all.

Six months after we filed our plans for the canal everybody in the locality who had a claim for damages, whether for oyster beds destroyed, for land taken, or for riparian rights, had filed, as the law provided, their claim with the county commissioner. All of those claims were filed in seriatim with the State treasurer of Massachusetts, and the company deposited, as Mr. Flanagan had deposited, with the State treasurer, $200,000 in cash to secure these claimants against any damage that they might suffer by reason of the canal being built. Before we could release our deposits the State treasurer had to satisfy himself, under the law, that all claims for damages had been satisfied.

Col. FISK. You have no court decision, however, on that one case?

Mr. COAKLEY. It was not necessary to go to court on that matter.

Col. FISK. Might it not be carried into court, where it would have to be defended and a final adjudication gotten upon it?

Mr. COAKLEY. I doubt very much whether it would, because that party has never even referred to the matter again. Very little attention was paid to that matter. It was simply a question of a question being asked and answered, that was all. It was not in the nature of an absolute right upon which any stress was placed. In answering your question, Gen. Abbot, I will state frankly that is the only case, along the 16 miles of the canal, from which trouble possibly could arise, and that case does not cover an area of more than 250 feet, I believe. It is very small. In fact their water line I think goes into the canal proper; just a shallow bank, which happens to run in a little bit farther.

We now come to the next question, the amount segregated by the accountants here, which is called discount on bonds, etc. The manner in which it is presented here might give you a false idea of what that item of discount was. It is presented here as representing discount on $4,312,500 in securities, while as a matter of fact that discount was the only discount in the whole financial transaction covering $12,000,000 in securities. The amount of $1,006,250 represented there as discount is really the cost of financing, and it is really the cost of financing the entire $12,000,000 of securities which were received by the construction company from the canal company.

Col. FISK. What is that item?

Mr. COAKLEY. $1,006,250.

Col. FISK. That was the discount?

Mr. COAKLEY. Yes. It is represented here as discount on $4,312,500, but that only covers half of the securities. The other half of the securities were financed, but there is no discount on that. It really covers the entire capitalization of $12,000,000 of the canal company and in effect it amounts to 8 per cent on $12,000,000. It was a very economical and advantageous arrangement for the company to be able to do financing for that amount during those times, because in 1909 financial conditions were not of the best and it was rather difficult to raise capital for any new enterprise. That figure of $1,006,250 we have always considered low as representing the cost of money to finance the enterprise.

Gen. ABBOT. It looks high, because it covered only one-half of the amount.

Mr. COAKLEY. Yes. They actually took the figures as they went through the books. Those are the book figures, but in fact it is the actual discount on the entire capitalization of the canal company. It is practically 8 per cent, and in a public-utility enterprise 8 per cent on its securities to finance is considered very, very reasonable.

We come now to the next step in the audit, covering results of operation. They have segregated this into three periods, and rightly so, to show by analysis what each period of operation resulted in.

"Period of partial operation, from July 30, 1914, to May 31, 1915.

"Period of partial operation (extended), from June 1, 1915, to April 10, 1916.

"Operating period proper, from April 11, 1916, to August 31, 1917."

Their comment on those three divisions is as follows:

"But whatever date be adopted, whether May 31, 1915, or April 10, 1916, as the date of the termination of construction and commencement of operation, the essential

fact remains that the canal had not yet reached a self-supporting basis, even at August 31, 1917; that is, the earnings had not sufficed to pay the operating expenses, without any consideration whatever of the interest on the bonded or floating debt. While, therefore, the deficit (and interest in addition) to April 10, 1916, must be regarded as a loss incidental to construction, and, therefore, as an element of cost of the investment, the question arises whether the loss for the further period from April 10, 1916, to August 31, 1917, should not be placed on the same footing."

That is their comment. I would point out that in the loss of operation totaling $1,500,000 from the very first day there was any traffic to August 31, 1917, they have placed only $713,246.69 as the loss for the operating period proper. The other $390,002.03 and $423,949.70 cover the loss for the periods when there was only partial operation going on, and really during the construction period.

The date of April 10, 1916, fixed by them as the date of actual completion of construction, is the date fixed by the joint board of the State of Massachusetts, the date when they accepted the canal as finally dredged to its complete depth, as required by the charter and the contract.

The date of April 10, 1916, is the official date. Our books are predicated on the fact that we have a certificate of completion for June 1, 1915. But our contract obligated us—and I am speaking now from the standpoint of the construction company—to maintain the canal prism and banks for a year after that date. That year of maintenance really did not expire until April 10, 1917, and therefore the date of completion of construction and commencement of operation was very much confused. The accountants took the official date of completion as of April 10, 1916, and they divide the loss; but in their direct costs, while they comment in regard to the loss incurred during the partial operation, they have not included that loss as a part of the direct costs, although they say they should be included and they are part of the costs. In their comment here they simply say it must be regarded as loss incident to construction and therefore as an element of cost off the investment, and the question arises whether the loss for the further period from April 10, 1916, to August 31, 1917, should not be placed on the same footing.

These operating losses are nothing more or less than the cost of development of the enterprise.

In our opinion the development of this traffic has been a difficult and trying proposition and yet has been very successful. For instance, it may be interesting to know, one class of traffic which we never calculated on in our estimates of earnings, was the schooners, the sailing vessels that would always proceed around the cape with favorable winds. To develop that traffic we practically gave them tug service free in the beginning to get them familiar with the canal. I know as an actual fact half of the schooner captains to-day have forgotten the courses around the cape. They have actually forgotten them and refuse to go around the cape. That was forcibly demonstrated to us at the time the canal was blocked in December of 1916. A certain captain called up on the phone from New York and wanted to know if the canal was blocked. I told him it was, and he said "Can't I go through?" I said "I am afraid you can not." He said "I will wait here a week if necessary, until it is clear." I told him "I am afraid it will take longer than that." He called up every day of that week, and I told him "We are sorry, but you have got to go around the cape if you want to get to Maine." He said "I can not. I have been through the canal every trip since it was opened; I have forgotten about the courses outside, and I won't go outside now." He tied his boat up for three months in New York. That is an actual fact. He tied his boat up in New York, put the boat out of commission, and did not put it back in commission until the canal was opened up the following March. At the present moment I think there is a schooner waiting at Buzzards Bay to go through. The captain, who has always used the canal, is a sort of leader in that trade and he said "I do not want to go around the cape; I won't go around, but I will lay in Buzzards Bay until I can get through or until you can give me a tug to take me through."

The schooner traffic grew to such enormous dimensions that we had to raise the rate of towage, which we did gradually.

Gen. ABBOT. And there was quite some rumpus when you did it, was there not?

Mr. COAKLEY. Yes. They were quite disagreeable about it. They felt that they should have a tug for nothing. The schooner captain as a rule thinks he owns the Atlantic Ocean, and he wants all the facilities that can be given him.

Col. NEWCOMER. Is that traffic hampered now by lack of tugs?

Mr. COAKLEY. Somewhat, because the towing company has gone out of existence. There was a separate corporation doing the towing from September, 1916, until 1918. It did not pay them to do the service, and the consequence was they went out of existence. Now the towing through the canal has got to be done by outside tugs.

These schooners have to hire a tug to take them through and it isn't as easy for them as it was when they got the tug for nothing.

Col. FISK. Does that involve a toll for the tug as well as the schooner?

Mr. COAKLEY. No, sir; the tug is free. Only the schooner pays the toll. The towing vessel goes through free, whether it is an outside vessel or our own.

Col. FISK. The company does not undertake to provide tug service now?

Mr. COAKLEY. Not at the present time. What we did was to provide the tug so that they would learn the advantages of the canal. We do not allow them to sail through; in fact they could not sail through, they had to have a tow, and to encourage them to use the canal we put the tugs there, and last year, 1917, there was a loss of $25,000 on tugs alone. The tugs did not pay. A big percentage of the traffic was schooner traffic.

Col. NEWCOMER. You do not anticipate that you will have a satisfactory development of traffic without the company providing tug service, do you?

Mr. COAKLEY. Yes; I do. The contention of the canal company has been justified and vindicated with respect to towing. It must be recognized by you gentlemen that the canal was a new waterway. There is nothing harder to change than an old sea dog who is accustomed to certain lines of travel. To get them to try the canal out we had to offer every inducement we could in the shape of free service, free pilots, free towing, and a nominal toll rate to make it as attractive to them as possible.

With the schooner class of traffic it is absolutely essential to have the tugs, but the barges and boxes come with their own tugs generally. The barges and boxes, the coal carriers, arrive with their own tugs and quite often the canal company would tow them through for a very slight consideration in the shape of a towing charge. They got in the custom of dropping their tugs at Buzzards Bay and let us take them through the canal. Then they would pick them up at Sandwich and take them to Boston, and so forth. When we discontinued our tug service they towed them through the canal themselves. One day last week we had, as I recall, 29 barges, 16 loaded with coal and 13 light, 16 going one way and 13 the other way. Over 10,000 tons of coal went through the canal that day; it was handled expeditiously; there were several outside tugs towing their own stuff, and there was no complaint. That was because they had to do it.

Col. NEWCOMER. They have the tugs to handle their normal business?

Mr. COAKLEY. Yes.

Col. NEWCOMER. How about providing a satisfactory service for schooners, when they had to rely upon outside tows?

Mr. COAKLEY. We haven't the slightest doubt that there will be tugs available to tow any schooners that come along. These outside tugs station themselves at both ends of the canal to handle the traffic going through. They are shifting tugs; they make Buzzards Bay a sort of shifting or switching station. The smaller tugs take the boats through the canal and on to Boston. The big, ocean-going tugs, come up from Norfolk. That traffic is gradually growing. Buzzards Bay will be a sort of switching station for the large ocean-going tugs. The small tugs take the tows through the canal and on to Boston and other eastern ports. At times the tugs going through the canal have nothing to do, a schooner will come along and that tug will pick up $20 or $25 by taking that schooner through. In that way the outside tugs make a little money.

Col. NEWCOMER. Does any of that coal moving from Norfolk to Boston pass through the canal?

Mr. COAKLEY. Practically all of it to-day. There are very few steamers carrying coal to-day. They are all in the ocean traffic. The coal is carried by barges and boxes. In fact I might, with perfect assurance, say that 80 per cent of the coal going to New England to-day that can do so goes through the canal.

Col. NEWCOMER. I can understand the movement of coal on the sound, but from Norfolk I thought that would go outside.

Mr. COAKLEY. No; it comes from Norfolk.

Col. FISK. Any from Philadelphia?

Mr. COAKLEY. No; that goes outside.

Col. FISK. That goes outside with the others?

Mr. COAKLEY. Yes. I do not know the reason except that they do not carry any insurance. They take their own risks going outside. We had one or two accidents in the canal which scared them somewhat. They made experimental trips through the canal, by sending a tow simultaneously from Philadelphia to Boston by way of the canal and one by the outside route. Their own tests proved that they could save considerable time through the canal, but unfortunately they tried that about the time that a lake steamer sunk in the canal and blocked it, and they have not resumed going through. They continue to go outside.

Col. NEWCOMER. Under what conditions do barge tows go through the canal with reference to the currents?

Mr. COAKLEY. At the present time they go through on any stage of tide. A tug takes a single barge alongside and goes right through, whether going with the current or against the current; but natutally they prefer to go with the current.

Col. NEWCOMER. Do they usually limit themselves to one barge?

Mr. COAKLEY. Yes. That is the best and safest way, in their opinion.

Col. FISK. With the tug alongside?

Mr. COAKLEY. With the tug alongside, yes. When they are coming light through the canal they prefer to go against the current. Then they have taken as many as six empty barges with one tug ahead. They usually take three barges in tow, but it has been proven that they can take six without the slightest difficulty.

Col. FISK. Do they ever tow with a hawser?

Mr. COAKLEY. Yes, when they come light against the tide. As a rule, going against the current, the tug is alongside on the quarter, secured fore and aft, so that they can hold it steady. They have taken two barges abreast, loaded, with the tug ahead, secured by a bridle towing arrangement, with a loaded barge behind, and the three go through in that way. It is a perfectly easy thing to handle. They break up their tows in Buzzards Bay now and take them through singly. They make up their tows again in Cape Cod Bay and proceed on to Boston.

Col. NEWCOMER. Why do they do that, if it is perfectly easy to take through three barges?

Mr. COAKLEY. It is a matter of their own discretion. They use their own judgment and do these things themselves. We would not attempt to tell them how they should take them through.

Col. NEWCOMER. I do not quite see the reason for adopting that method if it is perfectly easy to take three barges through.

Gen. ABBOT. That would depend on the size of the tug to some extent, would it not?

Mr. COAKLEY. Yes. They could do it with these big, ocean-going, powerful tugs, but those are not available at the present time. Those tugs have been taken for coastwise service and only the small tugs are available. A small tug, 95 feet long, with about 400 horsepower, is capable of handling one of these heavily loaded barges safely, but no more. Their own tow captains decide on the number of barges they will take through.

Col. NEWCOMER. The barges are of what tonnage?

Mr. COAKLEY. They run from 1,000 tons to 2,000 tons. We have had the biggest ocean-going barge in coastwise traffic, which carries 2,000 tons of coal, through the canal. She passed through the other day.

Gen. ABBOT. What does she draw?

Mr. COAKLEY. From 18 to 19 feet, loaded.

Gen. ABBOT. Some of those barges draw as much as 23 feet, the outside barges?

Mr. COAKLEY. The Wilkesbarre, owned by a big coal company, draws about 22 feet loaded. They use the canal, but when they go through the canal they only load her to 19 feet. She was the only barge of that size in the company's fleet. Those two barges that I refer to are the largest barges that have used the canal. Of course with steamers it is a different matter. The steamers are not so difficult to handle. The self-propelled steamers can operate in the canal without the slightest difficulty.

Col. ROESSLER. Are there many barges of the box type going through the canal?

Mr. COAKLEY. Yes, and the number is growing every day. Mr. James Hughes, jr., who is in the general transportation business in New York, started that traffic to Boston. I think he was the pioneer in that, that is in taking boxes to Boston by way of the canal. I do not think he got a license for his first trip, and took his own risk. The only thing the inspectors insisted upon was that he should not load to full capacity outside of Point Judith, because passing there they might get in rough water.

Gen. ABBOT. The same conditions that exist at New Bedford, with reference to water.

Mr. COAKLEY. Yes. Now he has a license and Mr. Hughes is operating a full fleet of boxes. There are two or three other concerns who have followed in Mr. Hughes's footsteps and are using boxes for coastwise coal transportation.

Col. ROESSLER. To Boston?

Mr. COAKLEY. To Boston. They go up to Maine and up to these New England points, and Massachusetts. Instead of distributing their tow in Boston Harbor now they have adopted the custom of breaking up their tow in Buzzards Bay and taking it from there to destination. That saves time in Boston Harbor and saves some of the congestion there.

Gen. ABBOT. They take them to Boston and Newburyport?

Mr. COAKLEY. I think so; yes, and also to Lynn.

Gen. ABBOT. It is very rough at Newburyport, a rough place to take a barge.

Mr. COAKLEY. Those boxes do not draw more than 14 or 15 feet, and they are very steady. They are less trouble to handle in the canal than the ocean-going barge.

Gen. ABBOT. In rough weather they are very flexible. It is so rough at Newburyport I do not think they would try it.

Mr. COAKLEY. I do not know whether they have actually gone to Newburyport or not, but I know that they have gone to Lynn and to Boston direct. In fact this man, James Hughes, has obtained a great deal of the coal barge business by reason of this box trade. Ultimately I believe boxes will predominate in the coastwise coal traffic.

Col. NEWCOMER. Do you think they are handled more easily in the canal than the ordinary ocean-going barge simply on account of their size?

Mr. COAKLEY. Well, they are smaller in the first place. In addition to that they run so heavily in the water that they do not swerve at all.

Col. NEWCOMER. They do not sheer at all?

Mr. COAKLEY. They do not, and there is no bow to them. The ordinary ocean-going barge has a bow and keel and in going against the current it is liable to swerve and to bear off. The box just goes against the current like a dead-weight. They go through at any stage of the tide. We have never had a claim for damages of any kind for box barges in the canal.

Col. NEWCOMER. Do the self-propelled boats go through on their own power?

Mr. COAKLEY. Absolutely. The big steamers of the ocean steamship lines and the naval vessels and everything go through without any assistance. I only remember one instance where assistance was given to a naval vessel in the shape of a tug. That was the monitor Tonopah. She was going to Portsmouth to the Portsmouth Navy Yard, I believe, and it being her first trip through the canal we felt that we might make matters safe by tendering the services of a tug to help her steer and keep her steady. The superintendent felt that he should tender the services of the tug. On the return trip of that particular boat the superintendent sent the tug out to help her when she came into Sandwich. The commander of the Tonopah asked what the tug was doing there and they told him they had come to lend help to her to help her through. He said "Stay away; I have been through here once and I do not need any assistance. I do not want you." We never tendered the tug again. That monitor goes through regularly on her trips east.

All the commander ever asks us to do is to have a receipt ready to give him for the toll that he was ready to pay.

Col. NEWCOMER. Have boats ever waited for a favorable stage of the tide on which to go through?

Mr. COAKLEY. No. Sometimes we have held up the coal barges for the steamers to go through. They practically have an express service through the canal with these passenger steamers. We can not allow anything in the canal while these big passenger steamers are going through.

Col. ROESSLER. How long does it take one of the coal barges to go through the canal?

Mr. COAKLEY. They will go through in about an hour. Against the tide it will take an hour and a half.

Col. NEWCOMER. Do you mean to say that they would go at the rate of substantially 5 or 6 miles an hour against the tide?

Mr. COAKLEY. With a powerful tug, yes.

Col. NEWCOMER. Then you have a current there of 3 or 4 miles an hour?

Mr. COAKLEY. That is about the maximum. I will say that they would not take a loaded coal barge against the full strength of the current now. They wait until the tide is either slackening or reaching its maximum—they take it on the rise and fall of the tide with all their heavy stuff.

Col. ROESSLER. How many boats are allowed in the canal at one time?

Mr. COAKLEY. That depends on which way the traffic is moving. They will not let anything go against the traffic, but you can put 100 boats in that canal if they are all going in one direction.

Col. ROESSLER. There are no passing points?

Mr. COAKLEY. Not in the canal proper. There are 8 miles of canal from land end to land end and 2 miles at each end of passing places. Those places are widened, and the 6 miles in between are uniform.

Col. NEWCOMER. There is 1 mile at each end?

Mr. COAKLEY. One mile at each end. Six miles is of uniform width, 200-foot surface and 100-foot bottom. There have been as many as three boats pass each other in that 6-mile stretch. I have been on a tug passing alongside of another tug which

was alongside of a coal barge it was towing. I have passed through that way in the narrow part, right at the Bourne section.

Gen. ABBOT. Did both tugs slow down at that time?

Mr. COAKLEY. No; they did not seem to me to do so. It depends upon the captain of the tug. If he is familiar with it there is no difficulty. The big eastern steamers, which can come through at any stage of the tide, prefer to come through with the tide than against it. They can go through the canal with a favorable tide in 45 minutes. Against the tide I think it will take them an hour and ten minutes.

Col. NEWCOMER. About what are the dimensions of those boats?

Mr. COAKLEY. The Bunker Hill and the Massachusetts are 4,700 tons gross, 320 feet long, I believe, and 56-foot beam. They draw about 17 feet of water.

Col. NEWCOMER. They have screw propellers?

Mr. COAKLEY. They are twin-screw boats, both of them.

Col. ROESSLER. I understood the boats of the Eastern Steamship Co., to which these vessels belong, drew from 20 to 22 feet loaded.

Mr. COAKLEY. No, they are 18-foot draft boats; they are passenger boats. I suppose if they were loaded to their full freight capacity in addition to passengers, they would draw 20 feet.

Col. ROESSLER. I mentioned the matter because it was taken up with me in New York Harbor, with reference to obtaining more water on Shell Reef, where the boats of the Eastern Steamship Co. are to dock in the future. I was told they drew about 22 feet.

Mr. COAKLEY. That may be the freight boats.

Col. ROESSLER. Do they come through the canal?

Mr. COAKLEY. Yes. They passed through the canal in the summer of 1916 and 1917. In 1916 they were coming regularly. I refer to the James S. Whitney and the Henry F. Dimmock, which were running between New York and Boston regularly. There are four of those boats. Those boats draw about 20 feet loaded and they were using the canal regularly.

Col. NEWCOMER. Those are the biggest boats that have gone through, I presume?

Mr. COAKLEY. Not the biggest. The biggest vessel that passed through the canal was a German steamer, but she was light when she came through. She was going through from Boston to New London to act as the mother ship of the Deutschland when she was anchored at New London. I refer to the German submarine.

Mr. WILSON. I thought that naval vessel from Philadelphia was the largest one.

Mr. COAKLEY. Oh, yes, the scout cruiser. She was a longer vessel. Her engines were out of commission and she was towed through the canal. Because of her length it took three tugs, two naval tugs and one of our own tugs, to take her through. She was the most difficult vessel to get through the canal that we have had.

Col. NEWCOMER. About what was her length?

Mr. COAKLEY. She is 400 and some odd feet long.

Mr. WILSON. Four hundred and twenty-three feet long, and her draft is 19 feet.

Mr. COAKLEY. That is nearly a hundred feet longer than the Bunker Hill or the Massachusetts. Those are the biggest ones that use our canal regularly. Then, there was a big ocean-going freighter. I have forgotten the name of the steamer which was the mother ship for the Deutschland, but those two were the biggest.

Col. NEWCOMER. The great volume of traffic does not exceed 20 feet in draft?

Mr. COAKLEY. There is very little coastwise traffic that draws more than 20 feet.

Col. ROESSLER. The canal was designed primarily for coastwise traffic, was it not?

Mr. COAKLEY. You can not put any of the large trans-Atlantic liners through, because they draw 28 to 30 feet. Those ocean liners can only pass through when they are light. The mother ship of the Deutschland passed through, keeping within the 3-mile limit all the way down to avoid the English boats that they thought were outside waiting for her. She slipped through the canal and got into New London. They were very glad that the canal was there, so that they could go down there and take care of the Deutschland. The captain of that boat said that the canal was bigger than the Kiel Canal, so far as he could see, and he thought it was very easy to get through.

Col. FISK. Did he mean the Kiel Canal at the present time, or before it was enlarged?

Mr. COAKLEY. I suppose before it was enlarged, although the dimensions of the Cape Cod Canal do not compare unfavorably with the dimensions of the Kiel Canal.

Col. ROESSLER. You have a curve in the canal?

Mr. COAKLEY. Yes; there is one quite broad curve. Gen. Rossell passed through the canal. Did you distinguish the curve when you reached it, General?

Gen. ROSSELL. Yes, I did, in one place.

Mr. COAKLEY. Yes. A stranger going through and looking for the curve might have trouble in finding it when they were on board the boat.

The CHAIRMAN. Is the canal widened in that bend?

Mr. COAKLEY. No. The prism of the canal there is uniform.

Col. NEWCOMER. Apparently you do not have any tangent at all, except for a very short tangent at the end. About two-thirds of it is on a curve, at least.

Mr. COAKLEY. Mr. Parsons submitted a paper which he wrote which gives the actual distances for all those curves.

The CHAIRMAN. You mean the paper he presented to the American Society of Civil Engineers?

Mr. COAKLEY. Yes. He gives all the actual dimensions in that paper.

Col. NEWCOMER. What is the price at which the canal was offered to the Government; what offer was made to the Government to sell?

Mr. COAKLEY. That I do not know.

Capt. WEBER. That is not indicated at all, Colonel.

Col. NEWCOMER. Have you made an offer?

Mr. WILSON. Secretary Daniels asked Maj. Belmont about 18 months ago what it would cost to buy the canal. Maj. Belmont told the Secretary that if the Government desired to take over the canal it would not be the purpose of the owners of the canal to seek to make any substantial profit out of the transaction; that the canal would be taken over by the Government at practically its cost. This bill that was passed by Congress last year contemplated the fixing by the Secretaries, with the assistance of the engineers, a reasonable value on the properties and franchises of the canal company. At that time Secretary Daniels wanted to know what that meant in dollars and cents. He said, "What will the canal cost?" Maj. Belmont replied that in so far as our books showed, approximately $13,000,000 had been the cost of the canal. As the matter went on we had the audit company of New York make an audit of the books to determine that cost, and Gen. Rossell had the Price Waterhouse Co. make an audit. We estimated the cost of the canal at that time at approximately $13,000.000. Mr. Belmont told the Secretary of the Navy that if the Government wished to take the canal over it could take it over at its cost.

Col. NEWCOMER. I was under the impression that the company had made an actual offer.

Gen. ROSSELL. I think there was a written offer from Mr. Belmont of $13,000,000 made to one of the Secretaries.

Mr. WILSON. The only written communication was the result of that conversation with the Secretary. I was present personally at the time. Secretary Daniels stated, after that conversation, that he would like Mr. Belmont to give him in writing the details of the canal and what he had stated relative to its cost. We would be very glad to lay before this board a copy of that communication. I think I can have it here by to-morrow morning. I will be very glad to lay before this board a copy of the communication which was sent to Secretary Daniels.

The CHAIRMAN. Will you do that, Mr. Wilson?

Mr. WILSON. As a result of that conversation with the Secretary, he requested that Mr. Belmont come to Washington to see him. That was about 18 months ago. The purpose of that communication was to brief the conversation that occurred.

Gen. ABBOT. Was not that letter filed with me in New York by Capt. Miller?

Mr. WILSON. I think so. I think you were given a copy of that letter.

Gen. ROSSELL. It is a short letter and winds up with a statement about the $13-000,000.

Mr. WILSON. In any event, I will send down to-morrow a copy of that letter, so that the board will have it.

Questions have been asked by members of the board relative to the value of the stock of the canal company and whether the stock issued by the company for these various purposes as touched upon by Mr. Coakley was issued at par.

I would like to make clear to the board this one point: While there was a certain interlocking of interests between the construction company and the canal company, the purpose of the organization of the construction company was two-fold. In the first place, it was necessary, under the statutes of the State of Massachusetts providing for work of this character, to have the joint board of the State offer to the general public tenders for bids for work of this character. One of the requirements of bidding was that a certified check in a very large sum—I do not remember at the moment what percentage of the bid—should be deposited with the joint board accompanying the bid. In order that those conditions might be complied with the construction company was organized with a capital of $1,000,000. Certain of the stockholders in the canal company at that time and certain gentlemen interested in the canal company subscribed for the stock of the construction company at par.

A million dollars in cold cash was therefore paid into the treasury of the construction company, representing its entire capital stock sold at par. I want to be perfectly frank with this board; we wish to lay our cards on the table. It was con-

templated by the organizers of the construction company, and it was so stated to prospective stockholders of the construction company, that there would be a profit, and perhaps a very handsome profit, to the stockholders of the construction company, and that was the object of the stock holders in subscribing to that stock at par—that they might gain a profit thereby. I was one of them, and I remember that very well. Unfortunately, the construction company came out 200 per cent shy of their capital.

I mention that, gentlemen, because I want to point out that this construction company was not a creation for the purpose of covering anything up; it was not a subterfuge of interlocking boards or interlocking stockholders, but that it was a substantial organization, capitalized by cash, to carry on the work contemplated by the canal company and approved by the joint board of the State of Massachusetts.

Gen. ABBOT. And capable of suffering losses?

Mr. WILSON. Capable of suffering losses, as it proved, yes.

The construction company tendered to the joint board a proposition to build this canal according to plans and specifications that had been approved by the Joint Board of the State of Massachusetts for $12,000,000. Under the law of Massachusetts stocks and bonds can be issued for public utilities only at par, in money, or equivalent value. The bid was accepted and the construction company was to receive $12,000,000 in the form of stocks and bonds, six millions of bonds and six millions of stock, representing the capitalization of the Boston-New York Cape Cod Canal Co. It then became an obligation upon the construction company to finance itself to construct the canal. The canal company entered into a contract with the construction company and received a large bond from the construction company that the construction company would develop the property. Having this $1,000,000 of cash capital on hand when it began, it then sold, as a first move toward its financing, $3,000,000 of its bonds. It sold those $3,000,000 of bonds for two reasons. In the first place, the bonds were sold at a time when underwritings were not going begging on the street, the financial situation was not as favorable as it might be. Secondly, the estimates made by the construction company for the building of the canal did not contemplate at that time just how many additional bonds would be necessary to sell to complete the work. I was not an officer of the company, but that is what happened. When the proceeds of the first three millions of bonds had been used in the construction there was absolutely no market for securities of any class.

It had then been demonstrated that the canal was going to cost much more than originally contemplated, and it was not as attractive a purchase at the time it would have been convenient to issue the second lot of securities as it was at first. The construction company found itself in a position of not being able to market its securities, so it had to go out in the highways and byways and finance itself in other ways. That resulted in creating the floating debt which now exists. It hypothecated its bonds and stock and borrowed this money to complete the work. It was unable to sell its securities. I want to make it clear to the board that these bonds were not sold by the construction company simply because they could not sell them.

On the question of the value of the stocks and bonds, I have asked a gentleman to come here to-day who is a member of the firm of Paine, McClellan & Campion, of New York City. I think it may be known to certain members of the board here that that firm is one of the recognized firms of expert engineers and accountants on public utilities in the United States. The business of the firm has been to appraise the value of public utilities all over the United States for a number of years, and they are considered experts in that line. I have asked Mr. Campion, of that firm, to come here and point out to this board the value of those stocks and to give you a comparison between what this company has done in the way of engineering expense, legal expense and the various subdivisions of the cost of the enterprise as compared with similar public utilities throughout the country. I personally am interested in a large number of public utilities throughout the country.

We have in the public utility business what we are pleased to term a certain yardstick which experience has taught us what percentage of the whole the costs feature of a public utility undertaking should reach. In other words, if we spend a larger percentage on engineering than experience has taught us should be spent on that class of work, we then call in the yardstick to determine whether or not we are proceeding along lines that are generally accepted by public service commissions that have been established by the courts of this country as fair and reasonable expenses for that particular class of public utility undertakings.

I take pleasure in introducing to you Mr. Campion.

STATEMENT OF MR. HORACE T. CAMPION, REPRESENTING PAINE, M'CLELLAN & CAMPION, OF NEW YORK.

Mr. CAMPION. My residence is in Philadelphia. My business address is 25 Church Street, New York. My age is 49. I am going to be very brief with the statement of my qualifications.

I am a member of the American Society of Civil Engineers and of the Street Railway Association. I am a member of the firm of Paine, McClellan & Campion, which was organized in September, 1916. The work of the firm since that date has been largely the appraisal of public utilities, amongst which were the following: The Orange County Public Service Co. of New York, the Public Service Co. of New Jersey, the Ohio Gas & Electric Co., the New York State Railways, Western Colorado Power Co., the Toronto Power Co., the Kansas Gas & Electric Co., the Potomac Electric Co., the Washington Railway & Electric Co., and there are a number of others, but of minor importance.

Prior to the organization of the present firm Dr. McClellan and myself were engaged in engineering work from 1907 during which time we did a large amount of designing and construction work on industrials as well as on public utilities. For four years prior to that I was employed by one or two engineering and construction companies entirely on the designing and supervision of construction work.

One of the jobs with which I was connected was the Ontario Power Co. excavation and structures in the Niagara River. In addition to that I built and designed a large number of terminal stations, car barns, power stations, and a good many engineering features of large buildings, such as the Indianapolis Courthouse, the Public Library, and a great many of the college buildings.

Prior to that I was with the street railways of Philadelphia in the engineering department, on construction work, for 11 years.

I think that is about all I care to say along that line.

I was asked by the canal company to go into the matter of costs. They gave me the report of Price, Waterhouse & Co. and the report of the audit company of New York. I have worked up a little exhibit about which I would like to talk, and I have here three extra copies of it and I would be glad to have you go over it with me.

In attempting to get at the fair value of the property, which was a question put up to me, and taking the Price-Waterhouse report as a basis, we find that certain payments were made for services or property in both cash and securities. I wanted to eliminate any question of the value of the securities because those services required could have been greater or less than the par value of the securities. There was one other thing there: In some of the so-called indirect costs in the Price-Waterhouse report there was a little confusion as to just what is contemplated by the accountants to be set up. For instance, engineering is redivided. We always put in field engineering, supervision, and engineering proper. That is merely our way of doing it. Other people do it in a different way. In administration we have supply expense and administration proper. I divide those so as to make it clear to my own mind. I did not want to be confused and have any duplications occurring.

The cost of labor and material, as set forth in the Price-Waterhouse report, I took exactly as they were shown, which represents the amount expended for labor and material.

There was only one thing that I could find that could be added directly to that, and that was something that would represent the cost of real estate and rights of way turned over by Flanagan to the canal company I have gotten at that in what I believe to be a fair way, and I think it is rather conservative. You will find that on page 2, item 2, "Land and options purchased from Flanagan, estimated."

The total item appearing in the report of Price, Waterhouse & Co. for land and land damages is $537,493.38. Included in that amount was the completion of options purchased from Flanagan, and also a certain amount of right of way and real estate that they required to complete the entire item of right of way and real estate. In the limited time that I have had, I got information from the officers of the company as to the proportion they purchased themselves and the amount they paid to complete the options that Flanagan turned over. I think the 60 per cent that we have used is a little lower than it should be. I had an opportunity to look over the amounts coming down on the train, and I think it should be a little nearer 70 per cent. But assuming 60 per cent, if we deduct from the $537,000 the $160,000 they paid to complete the Flanagan options we get an amount that represents 40 per cent, approximately, of the right of way and real estate. To determine the value of the Flanagan right of way and real estate it is simply a matter of proportion. By deducting the amount they paid, $160,000, it gives us approximately $406,000, which is the amount of real estate and right of way turned over by Flanagan. I do not say that this amount is correct.

I believe it is low; I think it is conservative, but I have tried to keep things on the low side rather than on the high side. That I have added to direct costs and called it cost of labor and material.

The items down to No. 15 are all taken from the book accounts, as shown on the report of Price, Waterhouse & Co.

Item No. 16 is field engineering and field supervision. The item of engineering in the Price-Waterhouse report, that is cash paid for engineering, is $322,131.46. From that I have deducted the salary paid to Mr. Barclay Parsons and the expenses of his New York office, which leaves an item of $191,721 for field engineering. That is a little lower than the usual percentage for that sort of work. It amounts here to a little less than 3 per cent, a very little less. It should be about 3½ to 4 per cent for work of this kind. I want to point out that that percentage is about the lowest that you could possibly do it for.

The supply expenses are located from a rather careful study of the so-called administration expenses in the Price-Waterhouse report. Unquestionably there was purchased material which cost money and certain material had to be stored and hauled from the storehouse to the point of use. I have given 2 per cent for supply expense, and that is based entirely on experience in similar cases of public utility companies. That could be divided up. The purchase is seventy-five one-hundredths of 1 per cent, inspection might be one-tenth of 1 per cent, and the rest is warehouse expense, which is a low amount for those items. I have taken those up and set them up in this way because the question of stock is involved in their payment.

The next item is the contractors' profits. That unquestionably was included in the stock payments to contractors. I do not care whether it was the construction company or who it was, they were entitled to a return for the work they did.

I have counted that as 5 per cent. They had to furnish certain field engineering, they had to furnish supplies and certain administration in the field, and that is not counted in that 5 per cent. That has been previously taken care of. The 5 per cent is what the contractors should have as profit. That brings the total field cost to $7,357,071.71.

Then there are costs that are sometimes called indirect costs. I do not like to call them indirect costs because they are very direct and I think to call them indirect costs is slightly confusing. There are other services and other labor needed to produce that physical property. There is an item of administration; someblody has got to look after it and tell them what to do. That I have estimated at 2 per cent of the field cost. That is the lowest we have ever found administration to cost. It has cost from 2 per cent to 2½ to 2¾ per cent, and it usually is about 2½ per cent.

Engineering proper consists of such engineering services as would be given to a project of this kind by Mr. Parsons or any other engineer. The engineer has office expenses, he has plans to make, specifications to write, and he has to investigate materials. He has to consider the project as a whole and the engineering costs on work of this size and character will run from 3 per cent to 4 per cent, and sometimes a little in excess. I have used 3½ per cent here because I believe it to be the lowest amount that it could be done for, in consideration of the fact that the field supervision item is lower than it should be.

We have always found legal expenses to be 1½ per cent on a public utility work of this kind. I turned to the Price-Waterhouse report and found they had set up in the report a certain amount for legal expenses. It was not complicated with any payment of stock, but was absolutely cash, and it came so close to the 1½ per cent that I used their amount, as it was only $3,000 off.

The next item is interest during construction. There was some confusion as to the date of completion. Mr. Parsons issued a certificate of completion in 1915. The joint board of Massachusetts stated that it was not completed until 1916. I took it that the joint board's statement was incontestable, that they had the right to say when it was completed. As they stated, it was completed on April 10, 1916, that is the date I have taken as the date of completion of the construction work, in order to obtain the interest during construction. I have used here 6 per cent for interest during construction period. I took the whole period, divided it by 2 and multiplied it by 6 to reach that, it being a seven-year construction period.

Col. FISK. But that assumes a perfectly uniform rate of expenditure.

Mr. CAMPION. Yes; it assumes that. I wanted to clear this point up. In the case of the Public Service Co. of New Jersey we were able to determine the interest during construction by taking the rate of expenditures and crediting the amount of interest with the interest on bank deposits, which is quite an elaborate calculation. It is not worth while. These people have spent money before starting construction; they have spent money for land and rights of way, and it would be very difficult to

get at the rate, in fact, impossible to get at it in the time I had to do it. As a matter of fact, in my opinion—and this has been borne about by a good many commissions by their decisions—a company is entitled to earn the allowable rate of return on expenditures from the time they are made. That involves the rate of expenditure to such an extent that I wanted to smooth that out, so I used the legal rate of interest and assumed an even rate of expenditure in order to smooth that difficulty out. I have always found that to be a direct way of getting at it and a short way, and it comes to just about the same as when you take the rate of expenditure, compile the interest and deduct the interest on deposits. I have never found it differs very much. You would simply get a little less on your interest during the construction than by doing it the other way.

Col. FISK. Ordinarily the construction expenses are on an increasing scale, are they not?

Mr. CAMPION. They are; but in this case they probably would not show that. They had a greater expenditure in the beginning. They had expenditures for land and right of way for years before construction started, on which no interest is counted. The history of the company shows that. Flanagan, for instance, had expenditures for land and right of way long before this construction period.

Gen. ABBOT. But his losses will be covered by the price at which he sold?

Mr. CAMPION. I do not know whether they would be or not.

Gen. ABBOT. But he would not have sold if they had not been considered?

Mr. CAMPION: I do not know. Mr. Flanagan got a certain price for the stuff he turned over, but whether it was at a loss or a gain I have no means of knowing, sir.

The total, after adding interest during the construction period, is what I called the total physical cost. The total physical cost is one element of the value of any property. You have two other elements. One is overhead cost, that is preliminary cost, the cost of financing and the conceivers' or promotors' profit. I would like to clear up any misunderstanding there may be about the use of the word "promoter." That does not mean a fellow that goes out with something and hawks it around and tries to sell it. It means the man that gets back of the thing and assembles all the information and gets ready for putting life into it. It may be one man, it may be the bankers who are the promoters, or it may be the people who are building the project, but it is some intelligence back of that project. I just want to clear up the use of that word "promoter." The other element in any valuation, which is just as real as labor and material, is the value of attaching the business or the development cost, or whatever you want to call it. It is money expended.

We have used here as preliminary expenses 2½ per cent of the total physical cost. That amount bears some relation to administration costs in nearly every case, if you have the same sort of men doing that work over the same or a greater period of time. In this case it was a far greater period of time and it increased the percentage from 2 to 2½ per cent on that account.

The financing expenses as used here means expenses of getting the money and not the discount that you paid for the money. When people go into a project, particularly a large project, they should arrange, and do arrange, that all of their expenditures will be met when they are required to be met. To do that a company that is not operating, that has no assets or credit, that is building up its assets, must go and get that money or its equivalent and it is paid for. That is the financing expense. I have allowed the lowest possible percentage for that financing expense, which is 5 per cent. People are constantly bidding against each other for money; money is needed everywhere, and it is the man that can pay the most, under the most favorable terms, that gets the money.

I have touched on the question of promoter's profits. I have given the percentage that is allowed by nearly every commission I have ever heard of. There is always some dispute about the amount of it. Some people pay more and some less. But its equivalent is allowed. In fact, all of these costs are allowed in some fashion by the commissions.

Gen. ABBOT. What is the interrelationship between the financing expense of 5 per cent and the promoter's profit of 5 per cent?

Mr. CAMPION. There may be none.

Gen. ABBOT. And it may be almost identical?

Mr. CAMPION. That might be, but it would be a double service rendered. They may have no connection with each other, sir. It is rarely that they do have any connection.

Usually the promotor goes to a banking house that has nothing to do with the promoting of the project and gets his financial support from them, for which he pays. Occasionally they are the same people, but if so, they render a double service.

Col. ROESSLER. When they render a double service they get double commission?

Mr. CAMPION. They should be paid for every value they give to it. When a man gives value he should have a return for it.

Gen. ABBOT. To continue that a little further so as to make it clearer, suppose that the man who finances the business instead of borrowing the money puts it in himself?

Mr. CAMPION. He would have to make some profit, sir.

Gen. ABBOT. He would get a double profit on what he put in himself, because he would be acting in both capacities.

Mr. CAMPION. He would be pledging his credit, something that he might be doing in some other place. I have something here that I would like to read on the question of cost of financing. It is very short.

Gen. ABBOT. We would like to hear that, if it will make this question a little clearer.

Mr. CAMPION. I am going to leave out the name of the company.

"Cost of financing: In estimating the reproductive cost now of the property of the * * * it is necessary to take into consideration and estimate the cash cost of obtaining the money for the payment of all obligations of the company during construction and until the time of completion.

"It should be remembered that this money is to be furnished to a 'company' which has no tangible property except as it produces it, which has no earnings and, therefore, which has no credit except what its individual members give it by their personal indorsement, and by their reputation for integrity and reliability.

"Those responsible for such a project, if they had experience, would never start it without knowing positively that they could finish it. They might have a scheme of their own of disposing of securities at a discount or otherwise, to raise the money themselves, or with the help of bankers. In addition to all this, however, they would require for their own security and for the completion of the project at the estimated cost, that someone who actually could provide the cash would guarantee to do so, if called upon. This is a kind of financial insurance, which in large projects is always necessary, and is quite distinct from the cost of securing the money by the sale of securities. In the present place, we have a total amount of $12,000,000, which would be required by the company constructing the property in installments throughout the period of reproduction.

"The bankers who would give this 'financial insurance' would be mortgaging their credit in advance for a period of years, without a full knowledge of what the money market would be, and without knowing what other opportunities might come to have to use their credit for greater profit. In some cases the cost of providing this service has reached as high as 15 per cent. It is believed that the cost which we have allowed here of 5 per cent is reasonable."

Does that clear up the question any?

Gen. ABBOT. That illustrates the point better.

Mr. CAMPION. I think the only other element left here is the development cost, which is the cost of bringing the business to the property. You have the property, but it is a dead property, and you have got to bring business to it and put life into it. In the case of a good many public-utility companies it is rather difficult to find out just what that cost is. There are various methods of measuring it. In one public-utility enterprise there is rather a definite way of measuring it. In the electric-light business they have a commercial department which costs a certain amount of money each year to run. At the beginning of the year they have a certain number of customers. At the end of the year if the company is successful they have increased the number of customers. They lose some, but gain others.

The difference between the customers at the first of the year and the last of the year divided into commercial costs is the cost of attaching customers. But in a company where there is no direct measure they must start out with the expectation of having a deficit when they start. The only way to get at it is to find out what their deficit has been. They are building up their business and it costs money to do it. I have taken here for the development costs, if you don't mind turning to next to the last page of this statement, the records for the period shown on the Price-Waterhouse report. If at the end of a certain period you have a deficit and you are carrying that deficit over, you are entitled to interest. I have no other way of getting at the separation of periods. You have that deficit through all the divisions of the report.

Gen. ABBOT. You have no other subdivisions that you could make?

Mr. CAMPION. No. I want to call your attention to that. It wouldn't make very much difference; it would be very slight. I have shown that the least rate of return that anybody would think of testifying to would be 8 per cent of the valuation, for the period between the time of completion, as stated by the joint board, to the date of inquiry into the value of this property, which was the 31st of August, 1917. It is set up there as the amount that should have been earned on it, the least they should have earned on it. The development cost is added to their deficit.

In the auditor's report you will find, in order to get it definite, that they added bond interest, so they get a larger deficit there. The question of proportion of stocks and bonds is largely an accident. If they had no bonds they would have no interest to add to them. If it was all bonds they would have a greater interest. It ought to be predicated on what the company should earn, the allowable rate of return on the money invested in every way. Eight per cent is low. That is why you will find some difference between development cost here and in the Price-Waterhouse report.

There is one other thing that I would like to say, gentlemen, and that is that this inquiry is of the date of August 31, 1917. In order to get at the value it should be the value of the cost of reproduction as of that date, uninfluenced by abnormal war conditions. I do not know whether these cost prices are too little or too much, but I know that if that is based on prices for the work to be done in 1916 and 1917 under normal conditions, excluding war conditions, that the prices would be 12 per cent higher than those shown. There has been a natural upward trend in prices of labor and material. I have just taken an estimate from the center of the construction period to the date of the inquiry, and the normal rate of increase per year, to determine that 12 per cent. That is eliminating all war conditions. You could not consider present-day costs of construction. You could not construct it at all to-day. You could not get the men or the material. I thank you.

Mr. WILSON. I do not know what your custom is about adjourning for lunch, but I think we can conclude in a very few minutes if you care to have us proceed.

The CHAIRMAN. Yes, go ahead.

Mr. WILSON. We have with us to-day a gentleman from Boston, Mr. Charles H. Innes, who is an attorney and who represents, I believe, certain bodies of that community. Having heard of this matter, as he puts it himself, he butted in and came down, and I am going to ask you to give Mr. Innes a few moments, so that he may present for himself what he has to present, which is entirely without my knowledge.

STATEMENT OF MR. CHARLES H. INNES, OF 53 STATE STREET, BOSTON, MASS.

Mr. INNES. We had a hearing before the Commerce Committee of the Senate, before which I appeared for the Real Estate Exchange of Massachusetts, which is interested in that matter. At that hearing the chamber of commerce was represented, various maritime associations were represented, and there was present both Senators Lodge and Weeks from our State and various of our Congressmen. Also the Chamber of Commerce of Portland, Me., and also similar bodies.

Of course at this hearing it develops that the matter you are most concerned with does not concern us at all. That is, we are not interested in any way in the price which the promoters of the canal may be awarded for the canal. Our interest is in the acquisition by the Federal Government of the canal and its operation by the Federal Government. It is for that purpose that we appear. Of course, we have been deeply interested in our State, and throughout New England, in this project, as you doubtless know. It has been discussed for upward of 100 years. Our State at times has thought of doing the work itself. Our State has been fairly liberal in doing work of this character without asking the assistance of the Federal Government, and the idea of building it jointly with the Government never took any definite form. Various companies have tried to do that work and have given it up after losing a good many thousands of dollars.

It was not until after Mr. Belmont and his associates appeared that anything definite was done. We, perhaps, did not appreciate at the time the commercial value of the work that was done. As I say, we are grateful that somebody did that work. Our interest now of course is in the future development of the canal as it affects our port and New England, and we recognize and agree that it should not be developed in the future by private capital.

I listened to what Mr. Coakley said. I had assumed that there were certain large vessels, warships, that could not use it for military purposes, and I had assumed that some of the coal steamers could not use it at the present depth or width. Therefore it ought to be acquired as soon as possible and the work of development and enlargement ought to be begun at once. We have hoped that that could be accomplished with considerable dispatch after your board reported. We had hoped that the matter would receive the consideration to which it is entitled and that a fairly speedy decision would be given; that it might be taken up at this session of Congress.

As Mr. Wilson has stated, after listening to what has been said, I thought I was rather butting in to say anything. I only wanted to say that we are all interested, that we are all anxious to have this development, and we believe that if some reasonable figure can be arrived at it will be better for all of us than it will be to have negotiations protracted until after the adjournment of this session of Congress.

We do not pretend to say what ought to be paid for Mr. Belmont's "baby." He has brought it up to the point where it is somewhat self-sustaining and where in the future it might possibly pay its father and the rest of those back of it. They certainly have gone through a period of some stress with it, and the child is doing fairly well now.

Whether the State should take it over at the actual expense to these parties or whether these other amounts which are here mentioned should be allowed is a question that we are very glad to have determined by a governmental body. I want to say, however, that in our State, in the charter which was granted this company in 1899, as I recall it, and later amended in 1900, there is what is called a recapture clause, under the terms of which the State may acquire the property upon paying back the $12,000,000 put into it and allowing the stockholders 10 per cent per year as a profit. That was regarded as a reasonable profit. Although they wanted more at the time, that was regarded as a reasonable profit on the doubtful value of the investment commercially at that time. If it were taken over in that way, that would involve an expenditure by the State of virtually $15,000,000. I do not know that those figures are absolutely accurate, but it can be readily determined what it would amount to.

Mr. WILSON. It would amount to over sixteen millions to-day.

Mr. INNES. It would require a considerable larger expenditure than it is suggested the United States should make.

Our board, which is a joint board comprising the public service commission and the river and harbor commission, now called the waterways commission, passed upon many of these issues of securities. I assume they must have determined in some way that they were fairly reasonable for the work which was done. I did not attempt to look over all of them, but I sent for copies of those votes, and they all state practically that upon hearing it appearing that the request to issue stock is proper and reasonable and that the work covered by the requisition has been done and material furnished, they thereupon authorized the issue of stocks and bonds for certain amounts. There are 26 of those votes, which I will leave with the board, each one of which is signed by our commissioners, one of whom has since been placed upon the United States Interstate Commerce Commission and who is known, at least in our State, as a man who scrutinizes the issues of stocks and bonds somewhat carefully. I refer to Mr. Anderson.

My only thought is this, and while it may be somewhat presumptuous to suggest it to you, gentlemen, it seems to me that in reaching a final conclusion the statement by Gen. Rossell that there should be paid $8,450,000, leaves it rather difficult to enter into any negotiations with the company by the secretaries, upon whom the responsibility devolves, I believe, because there are various items here which, as Messrs. Price, Waterhouse & Co. have stated in their report are items which might be allowed and might not, and which would be the subject of negotiations I do not know whether that would delay negotiations or not; I do not know whether it would bring about condemnation proceedings or not. I do not know whether the company would accept $8,000,000, but I assume from what they have stated that they would not. Unless some latitude is given in the matter I think it would mean a long delay in negotiations, which would certainly affect us and its value to us. I very much hope that in some way the facts can be given to the secretaries about these various transactions that they may be passed upon by them, or by this board, as a matter of negotiation with the present owners of the canal.

STATEMENT OF MR. H. P. WILSON, VICE PRESIDENT OF THE CAPE COD CANAL CO.

Mr. WILSON. I will take just a moment more, but I want to clarify some questions that were asked some of the gentlemen who have spoken to you.

Col. Newcomer asked a question about the Cape Construction Co. I want to make it clear to you that there were not less than six companies organized at various times for the purpose of constructing the Cape Cod Canal. Those companies antedated our interest in it and this Cape Construction Co. was one of them.

At the time the Cape Cod Canal Co. was organized and the rights taken over from Mr. Flanagan, of course, our attorneys looked very carefully into all of these companies which antedated that company with a view to seeing that the title was clear, and that company was simply one of the old concerns that existed before our time.

The CHAIRMAN. Was that work done for the Cape Construction Co. a part of the canal that was afterwards abandoned, at the Cape Cod end?

Mr. WILSON. I can not answer that question specifically. It was done by one of these previous companies. It may have been the Cape Construction Co. or it may have been one of the smaller companies organized for that purpose. Whether it was that particular company or not I do not know. It was one of a half a dozen companies, because, as you perhaps know, that enterprise has been undertaken by various people from time to time for the last 50 years.

Mr. COAKLEY. They dredged about a mile of channel in there. The dredge blew up that was working in the channel and we came along and had to blow the dredge out.

The CHAIRMAN. That work was abandoned and a new location taken?

Mr. COAKLEY. That was a part of the present canal; about a mile there.

The CHAIRMAN. I thought that had been abandoned.

Mr. WILSON. No. Another question was asked by Gen. Abbot, and a very proper question, with regard to riparian rights. I will be very glad, with your permission, Mr. Chairman, to send down here to-morrow a legal opinion by Messrs. Taft, Wickersham & Cadwallader, who have been our attorneys. They have gone into all that, and I will be very glad to furnish the board with a proper legal opinion as to the riparian rights on this canal. I think you will find that the canal company has acquired absolutely in fee the right to the land bordering on that canal. I do not believe that anyone holds any riparian rights, but I will be very glad to submit a proper legal opinion so that that matter will be cleared up.

I want to say, relative to this acquisition from Mr. Flanagan, that if the board would be interested I would be very glad to produce testimony here to show that what was acquired from Flanagan was of real, tangible value. Somebody asked a question whether Mr. Flanagan and his previous associates had been reimbursed for their expenditures. Not by any manner of means.

Hundreds of thousands of dollars have been lost in the Cape Cod Canal from which no one ever received any return. Mr. Flanagan has spent upwards of $600,000 on this project himself. He turned over to us, as Mr. Campion has made clear to you, approximately 70 per cent of the facilities we required to build this canal—that is, land, rights of way, and so forth—so that the amount paid to Mr. Flanagan, I think you will find upon careful study, was an exceedingly reasonable amount for the properties he turned into the canal company. If you were interested I would be very glad to send down the detailed expenditures by Mr. Flanagan, which of course antedated our interest, but merely that you may know that the property turned over to the company by Mr. Flanagan was acquired by him at a very substantial cash cost.

Gen. ABBOT. I think it would be very well to have a statement of that kind filed with the papers.

Mr. WILSON. I will be very glad to do that.

On this question of financing I want to say in passing, in order to make it clear, that the Cape Cod Canal Co. was authorized by the State of Massachusetts to issue twelve millions in securities for this canal. The cost of financing was approximately 8 per cent. The company did not have the trouble of financing, because that was all passed along to the construction company. It does not enter into this matter at all what it may have cost them. The fact of the matter is that the loss sustained by the construction company, charging those losses to any department of their activities that you please, makes the cost of financing this enterprise a fraction under 8 per cent. I want to respectfully submit that that is not an unusually high cost for financing a public-utility enterprise.

I want to say just one word in connection with the towing proposition about which Col. Newcomer had some questions. He asked whether or not we had abandoned the towing feature of our operations. I want to tell you very frankly, Col. Newcomer, why we did that. It was not so much a question of loss in operating our tugs, because we anticipated, when we began to operate them, that in the establishment of our business until the volume of business grew to a certain point that we would lose money in the operation of the tugs; but we did not anticipate this one very important feature: That so long as our tugs, so long as our captains, and so long as our pilots had anything whatsoever to do with the passage of a vessel through that canal that the canal company was furnishing a service not furnished anywhere else on the inhabitable globe, in that the company was assuming the sole responsibility for that portion of the navigable trip. The courts seemed to lean to that view, and it cost us several hundred thousand dollars in damage claims to ascertain that fact. While the enterprise contemplated merely the right to use the passageway, as is contemplated in other canals throughout the world, we were asked to furnish the additional service of assuming responsibility for ships because they were handled by our tugs and by our captains. Therefore, it was to relieve ourselves of that unfair and unreasonable responsibility that we discontinued it. We had gone into the business of creating a waterway to be used by those who desired to use it; that was our business. We never contemplated going into the shipping business and we never contemplated going into the towing business. When we attempted to build our business up by offering these facilities we were immediately taken advantage of to the extent that another responsibility was placed upon our shoulders and the captains of the vessels would say, "The ship is yours from the time she enters the approach to the canal until she comes out." We received no compensation for that, and so we abandoned the towing business.

I believe that the volume of business at the Cape—in fact it is being demonstrated every day—is sufficient to justify the people who are in the towing business to maintain their tugs at the point where that volume of business is offered. Wherever the business is offered in the greatest volume there the tugs will be found. Just at the present time the schooner traffic is a rather important one with us, but that is because of war conditions, and we are not living in an age of schooners. My prognostication is that when the war is over upward of 90 per cent of the business that will use that waterway will be self-propelled vessels, and I think the other 10 per cent will be of sufficient volume, perhaps, to justify the people who are in the towing business to furnish that facility if it is desired by the schooner trade.

In conclusion, I want to say this, as to the purpose of this meeting and your graciousness in hearing us after our request to be heard. We find ourselves in somewhat of an embarassing position. Mr. Belmont and all the directors of the company and its principal stockholders have wished sincerely and honestly from the beginning to avoid the appearance of attempting to unload a property onto the Government or an attempt to make a profit out of an enterprise that we have gone into, claimed by a great many to be an unsuccessful enterprise, but with which claim we take staunch issue. We have not been disappointed in our experience with the canal, aside from these extraordinary war conditions. I have been too long in the public utility business to expect to complete my property to-day and get it on an earning basis to-morrow. I have spent many years in the development of public utilities. Our experience in developing this public utility has been what we contemplated it would be. Aside from these extraordinary war conditions, it has set an entirely new mark of water transportation.

In our discussion of the matter with the Secretary, and I want to make this clear to Col. Newcomer or to any gentleman who had the impression that an offer had been made, that there was never an offer of this property to the Government. The owners of the property have never sought to sell the property: Secretary Daniels went through the canal a couple of years ago and was very much interested in it. The Cape Cod Canal—a canal across the isthmus—is not a new subject. It has been discussed since George Washington's time. Secretary Daniels, when making his trip through the canal, expressed some ideas of his own relative to Government ownership of property of that character. It was at his request that we came to Washington to discuss with him the canal and give him the data regarding the canal. It was at his request that the statement was made offhand as to what the canal had cost; it was to him we stated that if the Government desired this property that the canal company would not demand a substantial profit in turning it over.

The point we make, with every respect to Gen. Rossell, and I do not think anybody could have a higher respect for another than I have for Gen. Rossell, is we feel that the general, in reaching his conclusion, has penalized us, I won't say unfairly, but I think a more careful consideration of the figures by Gen. Rossell and his associates, will indicate that we are entitled to a broader interpretation of our costs in this enterprise than Gen. Rossell has seen fit to give.

What we ask of this Board of Engineers, and the object of our requesting the conference, is simply this: That you give us a fair and reasonable valuation of this property, based upon our cost; that you give our costs of every kind and nature the consideration they deserve, and nothing more, and we will be perfectly satisfied.

The law passed by the last Congress contemplates that in case the Secretaries of the Navy, War, and Commerce are unable to agree with the owners of the canal as to a fair and reasonable price, that the property may be condemned in the Federal Court of the Northern District of Massachusetts. At the time that provision was written into the measure we made no protest. We are not afraid of a condemnation proceeding. If the amount can not be arrived at in any other way, let us go ahead and condemn it in the courts; but we respectfully submit, as patriotic citizens, that it would be an exceedingly embarassing thing to us if we could not agree with the officials of this Government on the price of this property, which would make it necessary to go into the courts to determine its value. The State of Massachusetts has fixed its value by statute. At the time they granted our charter they determined the method of calculation to be employed in the event they exercised their right to take the property over, so that were we dealing with the State of Massachusetts there would be no question and no argument; it would be fixed. We are dealing with the United States Government and we want to deal fairly, squarely, and honestly and we ask you gentlemen to give such reasonable consideration to these various items entering into the cost of this property that to you may appear proper.

We have here Mr. Douglas, of the firm of Barclay, Parsons & Kiapp; we have a representative from the Price-Waterhouse Co.; and a representative from the Audit Co. of New York. We asked those gentlemen to come here, thinking that perhaps

you might wish to ask them some questions, and if such is the case I am sure these gentlemen will be very glad to come back this afternoon if you so desire.

Col. NEWCOMER. You referred to the discontinuance of your towing service on account of the legal obligation that was placed upon you.

Mr. WILSON. That was the principal and actuating motive for discontinuing it.

Col. NEWCOMER. Has it not been held by the courts that there is a legal obligation resting upon you to furnish a safe waterway?

Mr. WILSON. I am very glad you asked that question, because the courts of Massachusetts have just handed down a decision in the case of the *Bayport*. The last serious accident in the canal was the sinking of the collier *Bayport*. That case has just been decided by the courts in Boston, which held the canal company absolutely harmless and blameless, because the *Bayport* was navigated by her own officers, with the assistance of outside pilots that they had employed and because no employee or officer of the canal company was in any way, shape, or form connected with her passing through the canal. In other decisions it has always been the purpose of the opposing party to show, and they have succeeded in it, that by reason of the canal company having a representative aboard the ship—not in actual command of the ship, although in one or two cases our own pilots were in command of the ship, but where we had our representatives aboard the ship—that they were in practical control of the ship and that if anything happened, regardless of whether it was the steering gear or whether the vessel should not have been permitted to go through the canal, we have been held responsible.

As far as I am concerned, I opposed from the beginning the company going into the towing business, because I thought I foresaw just such a condition. It was thought necessary to establish the business, but it proved a very costly method of establishing the business to us. And if I personally passed upon that matter I should never have undertaken to provide the towing. The joint board of the State of Massachusetts has passed upon the question of a safe waterway. The large volume of business that has been done through that canal has answered the question. For a whole season the Eastern Steamship Co., with their large passenger steamers, has operated twice a day through that canal and some thirteen or fourteen thousand vessels of substantial size have safely navigated that canal. Your own engineers, in making an investigation of the subject, find that accidents that have occurred in the canal have not been due to the faulty construction of the canal or the faulty operation of it. We have contended in each case that it has been caused by faulty navigation or the faulty construction of the vessel that has caused the accident, because following them in and out every day have been similar vessels in large numbers. The canal has now been in operation too long to have the question raised as to whether or not it is a safe waterway, because every type of vessel that has passed through that canal has successfully navigated it time and time again.

Col. NEWCOMER. The point I wish to raise simply was whether the courts, in passing upon this matter, had considered it from that point of view——

Mr. WILSON. No, it has always been a question of responsibility.

Col. NEWCOMER. I have in mind the case of the suit against the United States for damage to a boat which the owners would claim was due to the facilities of navigation furnished by the Government not being safe.

Mr. WILSON. I do not think that such a suit could be brought. It has always been a question of responsibility.

Col. NEWCOMER. There is another point. The district engineer and the division engineer who handled this matter submitted a report and have recommended a figure at which the canal might properly be acquired.

Mr. WILSON. Yes.

Col. NEWCOMER. It seems to me we ought to have a statement from the Canal Company as to the figure at which you are willing to sell the property.

Mr. WILSON. We stated in the letter, a copy of which we are going to send to you—and mind you, that letter is dated 18 months ago, and there has been considerable capital expenditure in connection with the canal since that time, and the report of the auditors is from August 31, 1917, and we are now down to the middle of April, 1918—we stated to Secretary Daniels that the canal had cost us approximately $13,000,000. Your engineer, as a result of investigation by his own auditors, found that the cost of the canal, direct and indirect, amounted to something over $12,800,000, if I remember correctly. Our position, Col. Newcomer, is that the legitimate, fair cost of the canal has been slightly upwards of $13,000,000. We feel that if the Government takes over the canal we should be reimbursed to the extent of that fair and reasonable cost. Nothing has occurred in these investigations or as the result of the audit by Price-Waterhouse Co. and the Audit Co. of New York to change the figures. I see no reason, based upon their own statement, to change the figure originally

suggested to the Secretary of the Navy as the approximate figure of cost. As to exactly what it would amount to to-day I do not know. It might amount to $13,000,000 and three or four hundred thousand dollars to-day, but I do not think there would be any disposition on the part of the canal company or its officials to split hairs on that question. Substantially $13,000,000 is what we feel we are justly and fairly entitled to for this canal.

Col. NEWCOMER. Don't you think that when this matter comes before the Secretaries they should have before them a definite statement from the canal company as to the value they attach to this property, and not merely an approximation?

Mr. WILSON. I have had many conferences with the Secretaries and I have not wished to volunteer anything. I wished to give them the data and information they required. Secretary Baker looked over this bill before it was passed by the last Congress and approved it in writing to the Senator in charge of it. I have always understood that the time would come when the three Secretaries would send for us. The Secretaries have understood that when this board had finished its work the report will go to the Secretary of War, as I undertand it, and we have understood, in fact it has been practically stated to us by the Secretaries, that there would come a time when we would be asked to come to Washington and sit down with the Secretaries and negotiate with reference to this canal. We have hoped that the report of this board will be of a character that the valuation arrived at by this board will be of an amount so that the negotiations will be a very simple thing. It will be exceedingly pleasant to us if the Secretaries will say to us at that time, "We find that such and such is the case; we find that so much should be paid to you for this canal;" that the negotiations would be closed at once. We have always felt that the time would come when we would be asked for just the thing you now speak of, and until we were asked by the Secretaries we have not felt that we wanted to go farther into the matter than was gone into in the case of Secretary Daniels.

Gen. ABBOT. I would like to ask one question as to the figures introduced by Mr. Campion in this hearing. I would like to know the purpose of the introduction of those figures.

Mr. WILSON. I will let Mr. Campion answer that question himself, because I think he can do it better than I can. As I understood it, the purpose of Mr. Campion's compilation was to show that the charges we claim here as entering into these costs are not unusual, are not extraordinary, and are entirely in line with accepted prices of similar enterprises elsewhere.

Mr. CAMPION. The purpose was to get at the value before the confusion existed as to the value of stocks and securities.

Gen. ABBOT. We have the figure 13,000,000, we have the figure 12,800,000, and we have the figure of 12,235,000, all of which have been in a way presented by the company, but none of which are finalities. Is that right?

Mr. CAMPION. The figures I submitted are a measure of value, something to be considered. I think they are all low, as I pointed out in my testimony. My figures on various items were low; that is, they were at the lowest point I could put them. They are simply a measure of value, something to be considered by you.

Mr. WILSON. I think it is only fair and proper for me to say that so far as I am personally concerned I have never seen those figures. I asked Mr. Campion, by reason of his reputation in these matters, to come down and present to this board his findings from the reports without any discussion with him. Mr. Campion has not been sent here to plead the cause of the canal company, because if he had been he may perhaps have been specifically instructed as to what to say. I have never seen his compilation and have not looked at it at all. I saw Mr. Campion Friday last just before I left for Washington, and I asked him to undertake the work. I have had no discussion of the matter with him since.

I just want to say one word in closing as far as the administration of this company is concerned. I think you will find, by going into the detailed accounts, that there have been no extravagances and no excessive payments made to anyone. I have been vice president of the canal company for years and have devoted a great deal of time and attention to it. I have done a great deal of hard work, primarily because I am a stockholder and director of the company and have a very substantial interest in it. I have never received 5 cents in compensation from the canal company in any way, shape or form. Mr. Belmont, as president of the company, has never received a dollar. Mr. Belmont's company has received the compensation as set forth in the report. No officer of the company has ever received any compensation of any kind or nature, except the man who superintended the actual work. I simply mention that as evidence of the fact that we have attempted to operate the property economically and wisely until we had reached the point, perhaps, where we might be justified in paying our officers some compensation. I want the board to understand

that what I have done for the company I have done as an interested official of it and not for compensation. I have not received compensation in any way, shape or form, nor has Mr. Belmont. Our directors have received $20 per meeting, and no salary has ever been paid a director. The fees paid our attorneys have in every case been passed upon by our board and many times we have sent for our attorneys and asked them if they could not consistently reduce their charges. Our attorneys in all cases have been firms of eminent respectability and standing and whose charges really will be unquestioned. In regard to the charges by the engineers, we will not admit for one moment that the charge by Mr. Barclay Parsons was 5 cents more than it should have been. In fact we do not believe in the whole ramifications of the matter that anybody has overcharged us.

The amount at which we settled with Mr. Flanagan was a matter of congratulation to all concerned. We felt that Mr. Belmont had done a very clever day's work when he closed the matter with Flanagan, because the representations made by Mr. Flanagan and the price set by him were so much at variance with the result that we finally reached, that we felt we had made an economical purchase in acquiring those rights. I think you will find that has been the policy of the company all the way through. Expenditures were very carefully watched. Private enterprise, as a rule, watches those things, gentlemen. It was our purpose to establish this enterprise at as low a cost as possible and I am very frank to say to you, gentlemen, that it cost us a great deal more money than we contemplated it would cost.

Gen. ABBOT. The costs have increased all along the line?

Mr. WILSON. Yes. For instance, we encountered granite boulders as big as this building. That, of course, added to the cost. But the point I make is that while there may have been some errors of judgment and there may have been some mistakes made—we are all prone to those things naturally—but I can stand before this board and say that there has been not 5 cents worth of graft anywhere along the line. Nobody has ever participated to the extent of 5 cents in a way that could be questioned by anybody in this enterprise. From the time of its inception down to the present time it has been operated as economically as possible. We believe we have produced results, gentlemen, which we claim is a monument to the ability of Mr. Belmont and to his foresight and to those who had the nerve to go along with him in producing this very important improvement in our means of navigation.

You will find that all the evidence that we have furnished in this report in connection with the canal has been supplied by departments of the Federal Government. There has no ex parte information been furnished at all in this investigation, so I think it is a very simple matter to get at the facts, and find that for a very small amount of money a very great improvement has been made and a very substantial facility has been made available to the maritime interests of the Atlantic coast.

I thank you, gentlemen.

The CHAIRMAN. Will you tell us where we can reach you, Mr. Wilson, or these other gentlemen, if we care to question them?

Mr. WILSON. So far as I am personally concerned, I intend to return this afternoon, but I will be very glad to stay over if you care to have me do so. I will be glad to come to Washington any time and any of these other gentlemen will be glad to do the same thing.

The CHAIRMAN. I think we have about all we want now. I think we have a good deal to think over, but we may want to hear further from you.

Mr. WILSON. We will be very glad to hold ourselves in readiness at any time, and if you want us, do not hesitate to send for us.

The CHAIRMAN. I am speaking for myself now, and not for the board.

Mr. WILSON. I hope you will not hesitate to call us if we can be of any further assistance to you.

HEARING BEFORE THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS, IN REFERENCE TO THE CAPE COD CANAL.

[Under the Act of Aug. 8, 1917.]

10 A. M. TO 4.45 P. M., JULY 23, 1918

Present: Maj. Gen. Peter C. Hains, Brig. Gen. William T. Rossell, Brig. Gen. Frederic V. Abbot, Col. S. W. Roessler, Col. W. L. Fisk, Col. Henry C. Newcomer, members of the board.

The following-named gentlemen appeared before the board in reference to the above subject: Edward E. Blodgett, Esq., attorney for Cape Cod Canal Co., and others, 60 Federal Street, Boston, Mass.; Charles H. Potter, president of the Potter Transportation Co., New York City; W. W. Willett, president of the Seaboard

Transportation Co., Boston, Mass.; Jerome A. King, vice president of the J. C. King Transportation Co., New York City; Calvin Austin, president of the Eastern Steamship Corporation, New York City; John N. Cole, chairman of Waterways and Public Lands Commission of Massachusetts, Boston, Mass.; Edward Page, vice president of the New England Fuel Transportation Co., Boston, Mass.; Eugene E. O'Donnell, manager transportation division of C. H. Sprague & Sons, Boston, Mass.; Capt. John G. Crowley, president of the Consolidated Coastwise Co., Boston, Mass.; Lieut. Commander Thomas A. Scott, U. S. Navy; William S. McNary, member Waterways and Public Lands Commission of Massachusetts, Boston, Mass.; William C. Brewer, chairman of the committee on maritime affairs of the Boston Chamber of Commerce, Boston, Mass.; John W. Dalton, Sandwich, Mass.; Harrison Beardsley, representing Standard Oil Co. of New York, Marine Department, New York City; Henry C. Cadmus, vice president The Neptune Line, Boston, Mass.; James Hughs, jr., New York City; A. E. Beck, traffic manager The Merchants and Manufacturers Association, Baltimore, Md.; Capt. Harold L. Colbeth, superintendent of Cape Cod Canal Co., Boston, Mass.; Charles Maass, secretary of the Cape Cod Canal Co., New York City; H. P. Wilson, vice president of the Cape Cod Canal Co., New York City; J. J. Coakley, treasurer of the Cape Cod Canal Co., New York City.

STATEMENT OF MR. EDWARD E. BLODGETT.

Gen. HAINS. We are ready to proceed, Mr. Blodgett.

Mr. BLODGETT. Mr. Chairman and gentlemen, my name is Edward E. Blodgett, of Boston, and I have been asked to represent here not only the Cape Cod Canal Co. but the other interests of the Boston Chamber of Commerce and the Eastern Steamship Co. and various other interests who are here to testify in reference to their opinion on this question.

I understand that you want to make this as short as possible, and I am simply, therefore going to call the various men without any opening myself on my own behalf, and ask them to tell what their opinion is in reference to the advisability of the Government's taking and owning the Cape Cod Canal.

I understand from this morning's paper that the Railroad Administration has either taken already or is about to take the control of the canal, and the operation of it. The bearing that has upon this question of course I do not know fully, but it seems to me it makes it of great importance that the Government should own the canal if it is going to take over its operation.

But that question is another question, and I will not waste any more of your time now, because I know you are all busy men, but I will call the witnesses. I am going to call them somewhat out of order, because some of them want to get away and are down here on other business and have got to do other things. Therefore, I will call them in that way. I will first call Mr. Potter.

STATEMENT OF MR. CHARLES H. POTTER, PRESIDENT OF THE POTTER TRANSPORTATION CO., NEW YORK CITY.

Mr. BLODGETT. Your full name, Mr. Potter?

Mr. POTTER. Charles H. Potter, President of the Potter Transportation Co.

Mr. BLODGETT. Of New York?

Mr. POTTER. Yes, sir.

Mr. BLODGETT. You are interested in what line of business?

Mr. POTTER. Transportation of coal and other cargoes.

Mr. BLODGETT. From what points to what points?

Mr. POTTER. From Norfolk, Philadelphia, and New York to Long Island Sound ports, Boston, and along the New England coast.

Mr. BLODGETT. About what amount of coal and merchandise do you transport?

Mr. POTTER. We will transport during the year about 600,000 to 650,000 tons.

Mr. BLODGETT. Have you used Cape Cod Canal?

Mr. POTTER. Yes, sir.

Mr. BLODGETT. So you are familiar with it and its possibilities?

Mr. POTTER. Yes, sir.

Mr. BLODGETT. Do you know of the question of asking the Government to take the canal and own it?

Mr. POTTER. Yes, sir.

Mr. BLODGETT. And make it efficient?

Mr. POTTER. Yes, sir.

Mr. BLODGETT. Will you please give us, in your own words, your ideas upon that question?

Mr. POTTER. Uppermost in my mind, No. 1 is the submarine menace. By using the canal we are practically land-locked from New York down Long Island Sound, and so on through the canal into Cape Cod Bay and up to Boston.

Mr. BLODGETT. Go right ahead.

Mr. POTTER. Next is the question of the water. Our barges draw from 15 feet to 26 feet of water. At present the maximim draft we dare take through the canal is 19 feet.

Mr. BLODGETT. Why is that?

Mr. POTTER. For the reason that there are several shoal spots that have formed in the canal.

Mr. BLODGETT. That has been reported to you by your masters?

Mr. POTTER. Yes, sir. The masters of our tugs have informed me lately that they are getting somewhat apprehensive of taking these barges through the canal with that draft, owing to these shoals.

Col. NEWCOMER. They would take more than that on the tide, could they not? There is about a 5-foot tide at the West End?

Mr. POTTER. Of course we go through always at high water slack.

Col. NEWCOMER. That ought to give you a greater draft than 19 feet, because the low water depth is 19 feet?

Mr. POTTER. Yes, sir; but the tug can not always control the movement of your barge and keep her in an exact spot. Therefore, they are likely to give——

Col. NEWCOMER (interposing). But the shoal spots have a depth of 19 feet, haven't they?

Mr. POTTER. Yes, sir.

Col. NEWCOMER. And with a tide of 5 feet you would have a depth of 24 feet?

Mr. POTTER. Another drawback to that is that the tide is very strong, and unless we are there just at the slack water we have to wait over 24 hours to get another slack water.

Col. NEWCOMER. I thought you went through with the favoring current—with the tide?

Mr. POTTER. No, sir. We wait for slack water.

Gen. ABBOT. But you have two slack waters in the 24 hours?

Mr. POTTER. Yes, at nighttime; but our captains would not dare to go through at nighttime.

Col. NEWCOMER. I thought I saw some of your boats going through the other day with the current.

Mr. BLODGETT. Some had gone through.

Col. ROESSLER. You say your captains do not care to go through at night?

Mr. POTTER. Our captains do not care to go through at night.

Col. ROESSLER. Is the canal lighted?

Mr. POTTER. They have aids to navigation. The masters—we are controlled by the masters of our tugs. Of course, they are the men there to take those barges through.

Col. NEWCOMER. Have you ever taken through barges of more than 19 feet draft when they had a greater depth in the canal?

Mr. POTTER. No, sir. We are advised against it by the canal authorities as not being safe.

Col. NEWCOMER. To take more than 19 feet through?

Mr. POTTER. To take more than 19 feet through.

Col. NEWCOMER. When did they advise you that way?

Mr. POTTER. They advise us right along.

Col. NEWCOMER. I have not understood that that is the case before. I would like to ask Capt. Colbeth—he is here, is he not?

Mr. BLODGETT. He is not here at the present time.

Mr. POTTER. You understand this shoal has been forming of late.

Col. NEWCOMER. I have asked you about in the past, in prior years and months?

Mr. POTTER. No; we have not taken any deeper draft than 19 feet. It is not considered safe.

Col. NEWCOMER. There was a time when they had more than 19 feet?

Mr. BLODGETT. They were supposed to have 25 feet at one time, but it has shoaled at various times since that.

Col. NEWCOMER. Yes.

Mr. BLODGETT. I can say that in a case I tried against the canal company, the last case, I showed by the records that there were two places in the canal about a mile apart, where for a distance of 50 to 100 feet in length they would shoal about 18 to 18½ feet.

Mr. POTTER. At the present time we are asked by Mr. King with whom we do some business to tow one of his barges to Maine, and of course we preferred to tow this

barge through the canal. She is drawing 22 feet of water, and we are told by the canal company people that it is not safe to attempt it on account of this shoal.

Gen. HAINS. Mr. Blodgett, can you indicate about where that shoal is on the map?

Mr. POTTER. I understand it is up near one of the bridges.

Gen. HAINS. Which one?

Mr. POTTER. I am not advised as to that.

Mr. BLODGETT. I think we can indicate that, General, on the chart later on, if you will allow it to be done?

Gen. HAINS. All right, sir.

Mr. BLODGETT. If the canal were an efficient canal to a depth of 25 feet at mean low water and kept that way, state whether or not your barges and tugs would all use it?

Mr. POTTER. Yes, sir. We would put on heavier draft barges through there.

Mr. BLODGETT. And how about the New England coastwise trade, in your judgment, whether or not it would be used by them more or less exclusively to the use of the Slue, as an efficient canal?

Mr. POTTER. I have been told by many other transportation men that they would use it if there was a greater depth of water.

Gen. ABBOT. Suppose it was 25 feet all the way through, how deep draft barges would you be able to get your captains to tow through?

Mr. POTTER. That is 25 feet at high or low water?

Gen. ABBOT. Low water.

Mr. POTTER. I should judge they would think it safe to have a 5-foot leeway.

Gen. ABBOT. They want a 5-foot leeway in the canal, although they know it is clear all the way through?

Mr. POTTER. That is right.

Gen. ABBOT. And there are no waves in the canal?

Mr. POTTER. No waves, no sir. It is smooth water.

Gen. ABBOT. Under those circumstances, then, if the canal was 30 feet deep, you could not get your men to tow through anything less than a 25-foot barge?

Mr. POTTER. Yes, sir; I should say 25 feet. If I may add, I think if we had a locked canal there it would be different. We would then do away with the tide, and then I imagine, if there were no rocks on the bottom and a smooth bottom, that they would take close to 23 or 23½ feet.

Mr. BLODGETT. Mr. Potter, if the canal were efficient for the Navy to take their cruisers through, state whether or not, in your judgment, then, it would be efficient for the use of the commercial trade?

Mr. POTTER. Absolutely.

Mr. BLODGETT. That you have spoken of?

Mr. POTTER. Absolutely.

Mr. BLODGETT. Now, on the whole, what do you say as to the advisability, in your opinion, as to whether or not it should be taken by the Government and owned by the Government?

Mr. POTTER. I am in favor of the Government owning it. Take it from the maintenance standpoint, at present the canal is shoaling, and we have talked with the canal officials. The masters of our tugs are somewhat nervous about taking deeper draft barges through, and we are informed that it is impossible for them to obtain dredges to dredge out these shoaled spots. Also the dolphins, the piling to which the barges make fast, some of them have been pulled away, and they informed me that they were unable to get pile drivers. So that, in my estimation, the canal is deteriorating.

Col. ROESSLER. Do any of your boats from Norfolk or Philadelphia come through the canal?

Mr. POTTER. Yes, sir; at times.

Col. ROESSLER. Under what circumstances?

Mr. POTTER. Why, the class of barge; we have loaded barges at Norfolk and they have gone right up to Boston through the canal.

Mr. BLODGETT. And would all of your traffic go through the canal if the canal was efficient? I mean, your traffic from Philadelphia and Baltimore, if the canal were efficient?

Mr. POTTER. Yes, sir. We would use it entirely.

Col. NEWCOMER. Why would you use it?

Mr. POTTER. Why?

Col. NEWCOMER. Yes.

Mr. POTTER. We can make more trips per year. Consequently, we can deliver more cargo.

Col. NEWCOMER. Just what is the basis of your conclusion—the reason for your conclusion?

Mr. POTTER. Actual figures? I would say at least 33⅓ per cent increase in deliveries.

Gen. ABBOT. Although you have to wait 24 hours for a high tide at times?

Mr. POTTER. Yes, sir.

Gen. ABBOT. Do you mean to say that you would save one-third of the distance to Boston?

Mr. POTTER. I understood you to say tonnage.

Gen. ABBOT. That is the same thing, is it not?

Mr. POTTER. No, sir.

Col. NEWCOMER. Why not? How can you increase your tonnage one-third without saving substantially that distance? What is your saving in distance from Norfolk to Boston?

Mr. POTTER. I will take it from an actual tonnage standpoint, of course. That is what I based my figures on, the actual deliveries, and we will save time also. Of course, time enters into it as a factor, that is true, and I would say that at least we can deliver 33⅓ per cent more coal into Boston when we go into Vineyard Haven with favorable weather conditions. Another use of the canal, we can use it as a distributing center. There are times we have broken up our tows. We have a barge bound for Boston and another for Gloucester and one for Portland, and we break the tow at the canal and send the Portland barge on and go on to Boston with the Boston and Gloucester barge.

Mr. BLODGETT. That was being done when the Colonel was there the other day. So that, in your judgment, Government ownership of the canal would increase its efficiency?

Mr. POTTER. Yes sir; absolutely.

Mr. BLODGETT. I thank you very much.

STATEMENT OF MR. W. W. WILLETT, PRESIDENT OF THE SEABOARD TRANSPORTATION CO., BOSTON, MASS.

Mr. BLODGETT. Mr Willett, what is your business?

Mr. WILLETT. Transportation in coal.

Mr. BLODGETT. And what line do you have?

Mr. WILLETT. I am the president of the Seaboard Transportation Co., the owner of two tugs and seven barges.

Mr. BLODGETT. And you are also in the coal business?

Mr. WILLETT. In the coal business; yes, sir.

Mr. BLODGETT. How much of a coal business do you do with New England and southern ports on an average?

Mr. WILLETT. Our New England business is not immensely large; I suppose, perhaps, 25,000 or 30,000 tons a month.

Mr. BLODGETT. Have you in your business used the canal?

Mr. WILLETT. Very little.

Mr. BLODGETT. You did on one occasion, at least?

Mr. WILLETT. Yes, sir.

Mr. BLODGETT. The *William Chisholm?*

Mr. WILLETT. Yes, sir.

Mr. BLODGETT. And that vessel was lost in the canal?

Mr. WILLETT. Yes, sir.

Mr. BLODGETT. And that matter is now in the courts in litigation?

Mr. WILLETT. Yes, sir.

Mr. BLODGETT. What have you to say, Mr. Willett, with reference to the advisability of the Government's taking and owning this canal and making it an efficient canal for the use of the coastwise trade?

Mr. WILLETT. Why, I should say, if the canal was deepened and widened and made a safe waterway, that it would be very largely used in the matter of transportation for ports east of Cape Cod.

Mr. BLODGETT. And if it was put in such condition that it was fit to be used by Government vessels, would commercial vessels of a similar size use it?

Mr. WILLETT. I should think they would; yes, sir.

Mr. BLODGETT. And if it was put in efficient condition, would you use it with your fleet?

Mr. WILLETT. We should expect to; yes, sir.

Mr. BLODGETT. If it were safe?

Mr. WILLETT. Yes, sir.

Mr. BLODGETT. Have you any idea as to what depth it should be deepened to use for commercial purposes, or have you formed any judgment on that?

Mr. WILLETT. No; I do not know that I have, excepting that a vessel must have considerable free way in order to steer properly, and barges, I presume, draw all the way from 15 feet or less to 25 feet. Possibly there may be some a little deeper than that.

Mr. BLODGETT. Your barges, by the way, are box barges?

Mr. WILLETT. No; ship and built barges.

Col. NEWCOMER. What is the deepest draft of your barges, loaded?

Mr. WILLETT. The deepest draft?

Col. NEWCOMER. Yes.

Mr. WILLETT. About 24½ feet.

Mr. BLODGETT. And the deepest draft of your steamers?

Mr. WILLETT. We have not any steamers now in coastwise trade.

Gen. HAINS. Do your deep barges use the canal?

Mr. WILLETT. No, sir.

Gen. HAINS. Why?

Mr. WILLETT. At the present time we are trading entirely west of Cape Cod, so that we have no occasion to go around at all, but we have used the canal, I think, only once or twice with barges drawing about 21 feet, I should say. Then we used the canal with this steamer, having a rather unfortunate experience. I suppose we are like the burnt child dreading the fire, and we have not used it since.

Col. NEWCOMER. I think it would be well to put in the record that the *Chisholm* was sunk.

Mr. BLODGETT. Yes; I think the stenographer put that in.

Is there anything more you can say, Mr. Willett?

Mr. WILLETT. No; except that it seems to me, in theory, the canal is a good thing. I should think it would help New England very materially in the transportation of freight and commodities, always with the thought and understanding that the canal now should be put into proper condition for the handling of freight vessels that have to use it.

Col. NEWCOMER. You do not have any definite recommendation to make in that respect?

Mr. WILLETT. No, sir. I do not think I can qualify as a ship man.

Col. NEWCOMER. Neither as to depth or width?

Mr. WILLETT. No, sir. I think there are others who can answer that question so much better than I that it would be better for me, as a layman, not to do it.

Col. NEWCOMER. Don't your masters of your boats, or pilots, have any opinions on the subject?

Mr. WILLETT. I have not talked to them as to what they think about it.

Col. NEWCOMER. I would like to ask Mr. Potter about that point. I do not think you covered that point in your statement, as to just what you think they ought to have in the way of depth and width. I think you said 25 feet was probably sufficient.

Mr. POTTER. As to width, I said it ought to be twice as wide.

Col. NEWCOMER. That is, 200 feet instead of 100?

Mr. POTTER. Yes, sir.

Col. NEWCOMER. I see.

Mr. POTTER. To permit of a two-way canal.

Mr. BLODGETT. Mr. Potter, might I ask there if, in your judgment, there was a space perhaps of a mile in length half way through the canal that was widened double the width, so as to make a long passing space, like the siding of a railroad, whether that, in your opinion, might obviate the necessity of widening the canal for its full length?

Mr. POTTER. You are leading me into a line that I think experts should answer.

Mr. BLODGETT. Mr. Willett, on the whole, then, do I understand that you are in favor of the Government taking the canal and operating it?

Mr. WILLETT. Yes, sir.

Mr. BLODGETT. I think that is all.

STATEMENT OF MR. JEROME A. KING, VICE PRESIDENT OF THE J. C. KING TRANSPORTATION CO., NEW YORK CITY.

Mr. BLODGETT. Your full name?

Mr. KING. Jerome A. King, vice president of the J. C. King Transportation Co., New York.

Mr. BLODGETT. What barges and vessels do you use?

Mr. KING. We have 3 tugs and 10 barges that we own and control.

Mr. BLODGETT. And what commodity do you carry and from where to where?

Mr. KING. Normally we carry gypsum rock from Nova Scotia to New York in the open season of navigation, which is from the middle of April to about the 1st of December, and then during the winter months our barges normally and our tugs

are used in the transportation of coal from Norfolk, Hampton Roads, to New England points.

Mr. BLODGETT. Do you at the present time use the Cape Cod Canal?

Mr. KING. No, sir.

Mr. BLODGETT. Have you used it at all?

Mr. KING. No, sir; except for one small vessel.

Mr. BLODGETT. Why not?

Mr. KING. The bitter experience you probably remember.

Mr. BLODGETT. If the canal were opened by the Government and made an efficient canal——

Col. NEWCOMER (interposing). The board does not have the benefit of Mr. Blodgett's experience with these matters.

Mr. KING. It is another wreck.

Mr. BLODGETT. I will put it in the record. What wreck did you have there?

Mr. KING. We had a steel barge, whether 19 or 21 feet, you probably remember.

Mr. BLODGETT. I do not remember now.

Mr. KING (continuing). Sailing light from New York to Boston, and it was wrecked in the canal.

Mr. BLODGETT. It struck on the riprap?

Mr. KING. Struck on the riprap. If she had not had a double bottom, they would have taken her out plate by plate.

Mr. BLODGETT. She would have stayed there?

Mr. KING. She would have stayed there, but she happened to have a double bottom, and they got her out and repaired her.

Col. NEWCOMER. What was the special occasion of that loss?

Mr. KING. I do not know. It was very early in the opening of the canal, and I imagine it was bad management in towing her through. She was under the control of the canal authorities, the pilot and everything else. We took no responsibility whatever.

Col. NEWCOMER. What was the condition then as to the current?

Mr. KING. I do not know.

Mr. BLODGETT. I do not know.

Col. NEWCOMER. What is the draft of your barges?

Mr. KING. The draft of our present barges?

Mr. BLODGETT. Loaded, you mean, Colonel?

Col. NEWCOMER. Yes.

Mr. KING. We have one barge drawing 20 feet, and the rest of them average 22 feet 7 or 8 inches. Some of them draw 23 feet.

Mr. BLODGETT. And your tugboat drafts?

Mr. KING. About 15 or 16 feet.

Mr. BLODGETT. If that canal were an efficient canal and operated by the Government, would your tugs and barges use it in your Nova Scotia trade?

Mr. KING. Yes, sir; absolutely.

Col. NEWCOMER. If it were an efficient canal and owned by the canal company, would you use it?

Mr. KING. Yes, sir. We do not care whether it is owned by the Government or by the canal company.

Col. NEWCOMER. So that the public ownership does not cut any figure?

Mr. KING. No; not with us.

Mr. BLODGETT. Except as to the question of tolls?

Mr. KING. Of tolls, oh, yes. The question of tolls, of course, enters into it, but what I meant to say was that if the Cape Cod Canal was of sufficient depth and width for us to go through safely with our barges, on our Nova Scotia trips we would take them through regularly.

Col. NEWCOMER. You do not consider the tolls unreasonable?

Mr. KING. We do not consider the tolls. We consider the time and the conditions that exist between Vineyard Haven and Portland, and we would be willing to pay the difference in tolls to avoid that.

Col. NEWCOMER. What would make the canal efficient, in your opinion?

Mr. KING. Those barges should have at least 5 or 6 feet of water underneath them as they pass through. That would be 28 to 30 feet—whatever it may be.

Mr. BLODGETT. How about the width?

Mr. KING. Those barges run about 40 to 45 feet beam.

Mr. BLODGETT. I mean the canal?

Mr. KING. Two barges together would be about 90 feet, nearly. You would need at least 200 feet to make it safe.

Mr. BLODGETT. That is, for a two-way canal?

Mr. KING. Yes; for a two-way canal.

Col. NEWCOMER. Have they ever been through two abeam of these big barges?

Mr. KING. Do we?

Col. NEWCOMER. I mean, does anybody?

Mr. KING. I do not know. I have never had any experience in going through the canal.

Mr. BLODGETT. To your knowledge has the canal ever been an efficient canal for boats of your size?

Mr. KING. No, sir.

Mr. BLODGETT. I think that is all.

Col. NEWCOMER. One moment, Mr. King. You do not consider the currents through there as a fatal defect?

Mr. KING. Well, I should say, without studying the matter, no. I should think that the time of passing through the canal could be so arranged as not to be affected by that. It is only about 8 miles, I think, the length of it.

Col. NEWCOMER. Between Wings Neck and the eastern end of the canal 13 miles.

Mr. KING. And about 2 hours or 2½ time of passage. Is that it?

Mr. BLODGETT. Approximately that length of time of passage through the canal itself.

Mr. KING. It seems to me that expert pilots going through the canal would be able to so arrange their tows that it would not be a serious inconvenience, but we never could pass those barges and tugs through that canal without we had pilots—canal pilots. We never would put them through otherwise.

Mr. BLODGETT. The canal company does not have pilots. You would have to rely upon the Government pilots.

Mr. KING. Very well. Then we would have to have a Government pilot before we would go through. We could not do that on account of our underwriting proposition. In fact, it was a long while after our first difficulties before we would take a small boat through. We have a small boat that we put through there regularly.

Col. NEWCOMER. You say they would not let you put them through?

Mr. KING. Oh, yes.

Mr. BLODGETT. He says that has gone through regularly.

Mr. KING. Oh, yes; that has gone through regularly.

Mr. BLODGETT. Can you give us any estimate as to what proportion of the tonnage coming from South America that would use that canal?

Mr. KING. I could not tell you that. I can only tell you that our own tonnage is normally about 200,000 tons of gypsum rock and 100,000 tons of coal from the south when we can not go into Nova Scotia. Say about 300,000 tons a year that we would pass through the canal, light and loaded. You see, our barges go light one way every time. They go loaded from Nova Scotia to New York and light back. They come from Boston to Hampton Roads light, and with coal back, so that there is a light and loaded voyage for every tug.

Gen. ABBOT. When they go back light, how much do they draw?

Mr. KING. Those barges are mostly ship barges, and they probably would draw about 12 or 13 feet light.

Gen. ABBOT. But you do not even undertake to take them through the canal light?

Mr. KING. No, sir; we do not. They are very high out of the water, and if there was any breeze in the canal, we would have trouble in putting them over toward the banks and they are not fitted to use the canal in the present circumstances.

Gen. ABBOT. If the canal was twice as wide, would that make any difference?

Mr. KING. I should think it would.

Gen. ABBOT. Would not the wind blow them sideways?

Mr. KING. They could control them better.

Col. NEWCOMER. Has there ever been any complaint of wind action in the canal?

Mr. KING. I do not know. I am simply stating the circumstances of our barges, they being so high out of the water. That would be one of the things that would influence us not to put them through light, not that we have had any experience in it, but it would seem to me to be a natural result.

Col. NEWCOMER. What has been the deciding consideration in passing them outside rather than through the canal?

Mr. BLODGETT. You mean light?

Col. NEWCOMER. Yes. You have not considered it at all?

Mr. KING. We have not considered it at all; no.

Col. NEWCOMER. It is not worth while to consider that?

Mr. KING. No, sir; it is not worth while.

Col. NEWCOMER. I do not see that the canal is much use?

Mr. KING. Not to us.

Col. NEWCOMER. You have plenty of depth. You have over 5 feet that you ask for?

Mr. KING. You mean on the light barges?

Col. NEWCOMER. Yes.

Mr. KING. It has never occurred to us, because we have never used it the other way. The proposition of using the canal has been absolutely laid aside, so far as we are concerned.

Col. NEWCOMER. There has been no question of insurance there, or anything of that kind to affect it?

Mr. KING. No; I do not think so.

Gen. ABBOT. You speak of the canal saving time and its being desirable to get as rapid a turnover of your plant as you can. Why do not you consider the question of using the canal?

Mr. KING. The summer time is usually the time of the better weather. It is the early spring, fall, and winter time that we have our troubles around Cape Cod.

Col. NEWCOMER. You move light at those times?

Mr. KING. Yes.

Col. NEWCOMER. And at those times you could take them through the canal?

Mr. KING. Yes, sir.

Gen. HAINS. Mr. King, did you ever consider the question of a tide lock?

Mr. KING. Why, I have heard it discussed, but I know so little about the technique of those propositions that I would not be able to pass an opinion. It always seemed to me that the locked canal was the safest under all the circumstances, but I do not know enough about the subject to express an opinion.

Mr. BLODGETT. On the whole, are you in favor of the Government's acquisition of the canal?

Mr. KING. I certainly am.

Col. NEWCOMER. I think I would like to ask Mr. Potter why he does not pass his boats through there light?

Mr. POTTER. We do.

Col. NEWCOMER. That is your regular practice?

Mr. POTTER. We use it exclusively.

Gen. ABBOT. Have you had any trouble in blowing sideways?

Mr. POTTER. The type of barge we use is not as high out of the water as a ship barge, and we have no trouble.

Col. NEWCOMER. In spite of the fact you are going through light, you can increase your tonnage one-third by going through loaded also?

Mr. POTTER. With the exception of 2 barges and 7 tugs we are sending all of our vessels through there, which means 24 barges and 7 tugs. We are using it exclusively.

Col. NEWCOMER. The other barges that do not go through loaded, then, you are referring to to increase your tonnage on those barges?

Mr. POTTER. They are too deep draft.

Col. NEWCOMER. It is by means of those that you would increase your tonnage?

Mr. POTTER. Yes, sir. Of course, we are looking ahead and must have other vessels.

Col. NEWCOMER. Would those larger barges go through the canal light?

Mr. POTTER. Yes, sir; they would go through light.

Col. NEWCOMER. I mean, do they now?

Mr. POTTER. No, sir.

Col. NEWCOMER. Why don't they?

Mr. POTTER. For the last five months we have been sending them to Providence exclusively.

Col. NEWCOMER. I mean before that?

Mr. POTTER. I would not hesitate to put them through if I had the power there. The canal company did have one or two tugs there to assist, but they have recently taken those tugs away, and we would have to consider the conditions.

Col. NEWCOMER. I am referring to the time before, when there was an opportunity to go through light, and you did not take them through light?

Mr. POTTER. No, sir.

Col. NEWCOMER. I want to know why?

Mr. POTTER. It was probably the summer time, and we were headed right from Norfolk and took the outside route. Since the submarine menace we would not go that way. We would prefer to go through the canal and down Long Island Sound.

STATEMENT OF MR. CALVIN AUSTIN, PRESIDENT OF THE EASTERN STEAMSHIP CO., NEW YORK CITY.

Mr. BLODGETT. You are president of the Eastern Steamship Co., Mr. Austin?
Mr. AUSTIN. Yes, sir.
Mr. BLODGETT. And you have been familiar with this canal since it has been built?
Mr. AUSTIN. Yes, sir.
Mr. BLODGETT. And some of your boats use it?
Mr. AUSTIN. We have used it since it was completed in 1916 or 1917. This is the third year.
Mr. BLODGETT. Are you using it now?
Mr. AUSTIN. Yes, sir.
Mr. BLODGETT. With what boats?
Mr. AUSTIN. With the *Camden* and *Belfast*, passenger ships, and the *Winter* and *Dimock*, freight ships.
Mr. BLODGETT. How important is the use of the canal to you?
Mr. AUSTIN. We could not operate a passenger line between New York and Boston without the canal.
Mr. BLODGETT. Why?
Mr. AUSTIN. On account of the time it takes between the two points and the rough weather, the fog, and the uncertainty, and everything pertaining to go around. We could not consider it for a moment.
Mr. BLODGETT. You did operate the *Harvard* and *Yale* for some years?
Mr. AUSTIN. Yes, as long as they were a success financially.
Mr BLODGETT. Have all boats going through the canal been a success financially?
Mr. AUSTIN. Yes, sir.
Mr. BLODGETT. How much depth of water do these passenger boats draw?
Mr. AUSTIN. The ones we are operating now?
Mr. BLODGETT. The ones you were operating which the Government took for their purposes.
Mr. AUSTIN. 16 feet or 16½.
Mr. BLODGETT. How much water did they need to get through, according to your captains?
Mr. AUSTIN. We supposed when we put them through there that we had 25 feet, but after the latter part of last year the Government took them over, and I should question that they had over 20 or 21. The steamers we are putting through now draw 11 or 11½ feet, and sometimes we feel the bottom at extreme low tide in certain places.
Mr. BLODGETT. You do now?
Mr. AUSTIN. Yes; so much so that we could not hold one up the other day, and she touched and took a wheel off. They are turbines and have three wheels, and the inner wheel comes up pretty near to the bed of the ship.
Mr. BLODGETT. She touched riprap?
Mr. AUSTIN. I do not think she did. I think she touched hard bottom.
Col. NEWCOMER. Where is that?
Mr. AUSTIN. That is near Bourne Bridge.
Col. NEWCOMER. And on a draft of 11 feet?
Mr. AUSTIN. Yes, but my impression is that in changing her course she came pretty near the riprap and struck. My best judgment is that it was gravel.
Col. NEWCOMER. Is that the first time your boats have touched and done any damage?
Mr. AUSTIN. The first time our passenger ships have had any damage done to them. We put the *James S. Whitney* through two years ago.
Mr. BLODGETT. She was a freight vessel?
Mr. AUSTIN. She was a freight vessel, and we lost control of her and she went into the riprap and took her stem off.
Gen. ABBOT. Going with the tide?
Mr. AUSTIN. I could not say that. The tide does not affect that.
Mr. BLODGETT. You go through at night and all times?
Mr. AUSTIN. Yes, sir; not over three knots.
Mr. BLODGETT. You are running on schedule?
Mr. AUSTIN. Yes, sir.
Mr. BLODGETT. How much draft have your freight steamers?
Mr. AUSTIN. 19 feet. We do not attempt to put them through now—they are over 17 or 17½—but they hold up sometimes for tide at the mouth of the canal.
Mr. BLODGETT. Even for the 17 or 17½?
Mr. AUSTIN. Yes; we regulate our cargoes so that the vessels will have the tide as we come through the canal.

Mr. BLODGETT. What do you say as to whether or not the Government should take this canal or it should be left to private ownership?

Mr. AUSTIN. I think someone has got to spend some money on it; otherwise it won't be navigable two years hence, and possibly next year.

Mr. BLODGETT. Are you in favor of the Government taking the canal?

Mr. AUSTIN. I should say so.

Mr. BLODGETT. And making it efficient and keeping it efficient?

Mr. AUSTIN. Yes, sir.

Gen. ABBOT. Why do you think the canal company will not keep the canal up?

Mr. AUSTIN. There has been nothing done there this year.

Gen. ABBOT. Judging the future by the past?

Mr. AUSTIN. Well, yes; you can put it that way.

Col. NEWCOMER. Don't you think it is reasonable to assume that in the long run, in order to get anything out of that investment, they would have to keep it up because the keeping it up is not the large expense, as compared with the construction?

Mr. AUSTIN. Well, on the whole, we consider—I do not know how much business is being done; I presume the Eastern Steamship Corporation is using the canal more than anybody else—but the canal needs straightening. I am talking for my corporation. The *Massachussetts* and the *Bunker Hill* were 400 feet long, and in making those short curves it is a very difficult matter, and we stood in fear and trembling that the wheel or stern would touch. If the canal is put in proper shape and widened and maintained at a 25-foot depth and the curves straightened out we contemplate building two steamers 450 feet long that would carry 1,000 people back and forth between New York and Boston.

Col. NEWCOMER. Do you mean to say you want to cut the canal on different lines?

Mr. AUSTIN. No, straightened.

Col. NEWCOMER. Cut off some of the curves?

Mr. AUSTIN. Cut off some of the curves. One of the bridges or abutments is nearly out in the center of the channel.

Gen. ABBOT. You want the construction of the bridge piers changed?

Mr. AUSTIN. I should say if you widen that and make it 100 feet wider, that you would naturally make it straighter.

Col. NEWCOMER. They have simply provided for widening 100 feet on one side. You would follow the same lines exactly that you have at present, except to make it wider?

Mr. AUSTIN. That would have the effect to make it straighter.

Col. NEWCOMER. No, sir; not a bit.

Mr. AUSTIN. One hundred feet wider would help us very much in navigating through there in these long steamers. The ordinary freighter does not run over 300 feet. If you put on 100 or 150 feet more, it makes it very much more difficult.

Col. NEWCOMER. And the bridge has an abutment in the center of the channel? What bridge?

Mr. AUSTIN. The Bourne Bridge.

Col. NEWCOMER. As a matter of fact, all of these bridges are set with the center of the channel?

Mr. BLODGETT. The Bourne Bridge was not, because they contemplated it being widened, and captains, as I understand, go through that bridge and then have to go back into the channel again.

Mr. AUSTIN. It is but 40 feet between the abutments.

Col. NEWCOMER. But the actual channel at that point——

Mr. BLODGETT (Interposing). You have to change your course to get back into the channel again.

Mr. Austin, if the canal were widened at the curves, would that in your opinion be a straightening, what you call a straightening, of the channel?

Mr. AUSTIN. That was my idea, that if it was made 100 feet wider, that it would take care of itself so far as we are concerned.

Mr. BLODGETT. What is your opinion as to the Government's equipping this canal and maintaining it for the use of the coast tonnage?

Mr. AUSTIN. I should say the larger percentage of the coast tonnage would use the canal if it was put in shape as has been talked here, but for passenger business, passenger ships should have preference. How that should be arranged I do not know. We could not come down there and lay a couple of hours to get through.

Gen. ABBOT. Does the canal company now arrange the schedule of tows, so as to get your steamers through, without reference to the stage of the tide?

Mr. AUSTIN. Yes, sir.

Col. NEWCOMER. The opposing traffic is always held up for your passage?

Mr. AUSTIN. We are allowed to go through. I do not know how much is held up.

Col. NEWCOMER. If any presents itself, of course it is held up?

Mr. AUSTIN. Yes. We do not vary probably from Boston to the mouth of the canal, I do not suppose we vary 10 minutes, and not over half an hour the other way coming from New York, except in very dense fogs. We have been held up only twice this year.

Col. NEWCOMER. Do you have to have a clear way from the entrance of the canal at Sandwich to Wings Neck in Buzzards Bay, or only through the land cut?

Mr. AUSTIN. We have it all the way through, as a general thing.

Mr. BLODGETT. And through Buzzards Bay to Wings Neck is how far?

Mr. AUSTIN. Thirteen miles.

Mr. BLODGETT. No. All the way through?

Mr. AUSTIN. Oh, Buzzards Bay? Twenty-five.

Mr. BLODGETT. And that is Government ownership anyway?

Mr. AUSTIN. That is Government ownership anyway, and I think the Government dredged that channel.

Col. NEWCOMER. Oh, no; the canal company dredged it, and that is 300 feet wide, is it not?

Mr. AUSTIN. I do not know. We never have any trouble there.

Col. NEWCOMER. The point I wish to bring out there is, where you have a waterway 300 feet wide and all opposing traffic is kept out of the way while you go through there, would there be any prospect, if you had a canal 200 feet wide, that traffic could go in both directions?

Mr. AUSTIN. I do not think so, with our big ships.

Mr. BLODGETT. Do you run your boats in the winter?

Mr. AUSTIN. We attempted it in the winter in 1916–17, but they sunk a barge there and the ice came in and clogged it up.

Mr. BLODGETT. That was in Buzzards Bay?

Mr. AUSTIN. That was in Buzzards Bay, and on account of there being no traffic going through. So we gave it up.

Mr. BLODGETT. If the Government kept the Buzzards Bay entrance clear of ice, would you operate your vessels through the canal all winter?

Mr. AUSTIN. Yes, sir.

Mr. BLODGETT. And the clogging last winter was in the Government part of the bay, was it? It was not in the canal proper?

Mr. AUSTIN. Well, I am told—I have never been there but twice during the winter-time—that the canal itself keeps itself free with the tide and the currents.

Mr. BLODGETT. I can answer that by some of the men who have been down there. So that in your judgment the canal is necessary for the business of the Eastern Steamship Company?

Mr. AUSTIN. Most assuredly.

Mr. BLODGETT. If you intend to increase that business?

Mr. AUSTIN. Yes, sir.

Mr. BLODGETT. If the canal is equipped properly?

Mr. AUSTIN. Yes, sir. The Massachusetts and the Bunker Hill in 1916 carried 67,000 people outside and going through the canal 140,000.

Col. ROESSLER. In the same period of time?

Mr. AUSTIN. In the same period of time.

Mr. BLODGETT. That is in one year?

Mr. AUSTIN. In one season.

Mr. BLODGETT. Was there more traffic generally in that period?

Mr. AUSTIN. Yes, sir. You see, we are in sight of land from the time we leave Boston until we get to New York, and there is practically nothing but smooth water all the way. It is a great thing.

Mr. BLODGETT. The General asked you a question as to whether that was an increase on account of your going through the canal or whether it was an increase in general traffic that year?

Mr. AUSTIN. No, sir; going through the canal. That is what we attributed it to.

Col. ROESSLER. That is the point.

Mr. BLODGETT. And in your opinion would the traffic increase still more?

Mr. AUSTIN. There is no limit. In pleasant and warm weather, if we had the accommodations aboard our ships. We run full.

Mr. BLODGETT. So I understand on the whole you are in favor of the Government taking, equipping, owning, and operating this canal?

Mr. AUSTIN. Most assuredly.

Mr. BLODGETT. That is all.

STATEMENT OF MR. JOHN N. COLE, CHAIRMAN OF THE WATERWAYS AND PUBLIC LANDS COMMISSION OF MASSACHUSETTS, BOSTON, MASS.

Mr. BLODGETT. You have been interested in this canal since the beginning?

Mr. COLE. Yes, sir.

Mr. BLODGETT. And you are interested in the waterways of Massachusetts, and I wish you would give the board your ideas as to the advisability of the Government's taking and equipping, owning and operating this canal.

Mr. COLE. I do not think, Mr. Blodgett and gentlemen, that I should be called upon to pass upon the technical features involved. Our department's engineer had complete charge for the Commonwealth of the construction of the canal, and his judgment was followed pretty generally in most of the matters related to its construction.

Gen. ABBOT. That was Mr. Hodgson?

Mr. COLE. That was Mr. Hodgson at the outset and Mr. Williams later. Both of them, I think, rank pretty well—very high, in fact—and their opinion as to two or three of the technical things that have been touched upon here in this hearing and in previous hearings may well be brought to your attention, not in detail, for that is a matter of record, but that you may have in mind that they did not believe it was necessary that there should be a lock. That is the first thing, that they did believe that the tide would keep the canal practically free in the winter, if the openings at either end were kept as free as they should be for transportation purposes, that the width of the canal was never considered satisfactory for more than one-way operation; that it would not be difficult to deepen the canal from any engineering standpoint, wholly involving almost entirely the removal of sand and gravel, some clay and some bowlders; very little ledge; that if the canal were made wider there would be much less danger of filling in and shoaling than there is at the present time.

I think, perhaps, I can claim to have some knowledge of the value of the canal to New England and Massachusetts industries. I should not presume to pass upon the value of the canal from military needs or from the standpoint of better military operations, except to say that Massachusetts is at the present time building the largest dry dock on the Atlantic coast, the State itself paying for that construction. There is not the least question but that, if this canal is made of a proper depth and width, that would make that dry dock absolutely essential to the Federal Government and the Navy Department for taking to that dry dock vessels all along the coast, certainly as far south as Norfolk and Newport News, and if you should go further and finish the interior waterways all along the coast, this would perhaps be the most important link, from the standpoint of Navy defense, that could be secured from the entire interior waterway development.

The business end of it, from a study of that situation covering the last 20 years, I think I might say just a word on with some authority. New England to-day manufactures most of the essentials in manufactured goods, between 55 and 62 per cent of all. Boots and shoes, woolen goods, cotton goods, optical goods, jewelry—I could go down the line of the essentials that go into the everyday life. Those essentials are dependent upon raw materials brought to that section at as low a price as it is possible to bring them there, and can be kept in their present position of supremacy, which means service to the entire United States and not only benefit and advantage to the industries themselves, only by transportation facilities better than we have to-day.

Within the past month there has been fixed a change in rates by taking away differentials under which freight transportation to Massachusetts has been handled for many years, so that we are further discriminated against, and I do not use that word in any sense as a criticism, but say that the operation of those rates does discriminate against New England industry.

Gen. ABBOT. It accentuates its geographical position.

Mr. COLE. That is a better expression.

Col. NEWCOMER. Might we also say that it recognizes its geographical position?

Mr. COLE. Yes, and that is absolutely true, because while I have a very strong feeling that we ought to have those preferential rates, yet theoretically it is absolutely sound to say that it should cost more to carry a ton of freight 100 miles than it does to carry it 50 miles. That is absolutely sound, and hence, if it does recognize it, it should also recognize the obligation which the rest of the country owes to New England's development of those particular industries, because, let me repeat again, those industries mean more, because of the splendid development that they have had, the efficiency under which they are conducted, to the entire country than they mean to New England or to Massachusetts. In other words, it means something to the man in Seattle, Wash., that the piece of cloth made in the mills at Lawrence does not have an excessive burden of transportation put upon it, so that when it comes to him it has been increased and multiplied to a greater cost than it ought to be.

It also means—you may take it nearer to the source of raw material and supply of manufacture; that has never been done, probably never will be done, because it is not an economical manufacture. It does not fit into the program of political economy in handling business that robs New England, one-seventh of all the manufactured products in normal times of the entire country. It represented in the last year before the war approximately $600,000,000 of manufactured goods. It represented in tonnage passing into that territory approximately 30,000,000 tons.

The Cape Cod Canal as an interior waterway is to the minds of our commission and most men who have studied it almost the only direct method of relieving New England and Massachusetts from the cost which the railroads must charge according to your theory, which is sound, for its service. Water transportation can relieve that situation. Now, we in Massachusetts have gone a long way in helping this situation out ourselves. We have opened in the past year a pier at New Bedford, built by the Commonwealth, for direct ship connections by water of the cotton from the South to the fabricating plants of the North, namely, at New Bedford and Fall River. We are bringing great cargoes of cotton directly into that port at the present time. We have even anticipated what the Government is now proposing to do in the way of financing those cargoes, and instead of having the cotton manufacturer pay for his cotton six months before he ever saw it, it is possible to have that bill of lading financed in the banks of New Bedford exactly as your present Federal Reserve Bank is discussing financing cotton in all the ports of the country, and, as I say, we have anticipated the Government helping to make a direct ship connection between the South and New Bedford. We are getting ready for steamers at Fall River when the times are normal.

We have entered into the construction of a dock at East Boston, in order that we may save some handling through the city of Boston, and deliver wool and hides to the northern New England manufacturers over the railroads by direct connection with our new pier at Boston.

This shows that Massachusetts has been alert to make use of the facilities for relief of the situation. We have seen the Cape Cod Canal developed as it has been developed and serve what it has served. You gentlemen know it as well as I do. I personally believe it was a mistake not to go the full depth at the beginning, and if the canal is ever to give its full service it should be dug to at least 35 feet depth and 200 feet wide, and it should have large basins at either end for mooring vessels and handling your tows, as some gentleman suggested dividing up those tows for different shipping points, and with these facilities it can then be of tremendous service to New England.

I doubt if you will see a week of the next fifty-two that you won't have impressed upon you the fact that shipping that must go outside the capes is under a menace every month from one or other of the forces engaged in this present war. Bring them inside; give them ample facilities to pass through this waterway, and I can not help feeling—not being a maritime man, but I can not help feeling—that you have gone a long way toward helping the conduct of the war, so far as New England industries and shipping along the New England coast is concerned.

Col. NEWCOMER. What do you consider the adequate depth for commercial coastwise movement?

Mr. COLE. Thirty-five feet.

Col. NEWCOMER. You do not think anything less than 35 feet is adequate for commercial purposes?

Mr. COLE. No, sir.

Col. NEWCOMER. And the coastwise commerce requires that depth?

Mr. COLE. I do not have any doubt about it. Our barges are growing all the time. The tendency is to build larger and deeper and bigger carriers, and we are not in our pier developments thinking of having anything less than 35 feet.

Gen. ABBOT. When I was in Boston there was a tendency in the coal carrying trade to go to large colliers, rather than to barges. Is that condition now continuing, or is the coal carrying by barges?

Mr. COLE. Mr. Daniel Hamlin is the head of the Metropolitan Coal Company. The Metropolitan Coal Company is furnishing all the coal and handling all the coal used by the Navy Department in Boston at the present time—simply showing that it is the recognized factor in that position. He told me the other day that before they renewed their lease they must have an extra 5 feet—they did have 30 at the last point at low tide—because their new barges would absolutely require it.

Gen. ABBOT. So they are going back to the deeper draft barge, rather than to these colliers?

Mr. COLE. I ought not to say the new barges. I mean colliers. He has not used barges very much.

Gen. ABBOT. I was surprised when you said he was.

Mr. COLE. I should not have used the word "barge."

Col. ROESSLER. Is it possible to improve the canal to the ultimate width and depth required during the probable duration of the war, so as to make it effective before the war is over?

Mr. COLE. I doubt if you can have a completed widened and deepened canal, but I should think if there was plenty of money and plenty of desire combined, it would be easy in a few months. I would even say three months, to go in there and widen some places in the canal that would relieve the entire situation; that working into ultimate widening and deepening of the whole channel.

Col. NEWCOMER. Where is this coal handled in Boston that needs 35 feet?

Mr. COLE. Right on the harbor front. It is in South Boston, and also they have one plant in East Boston, but their works are in South Boston.

Col. NEWCOMER. Is not most of the coal handled—that is, in volume—in the Mystic River?

Mr. COLE. Yes, sir.

Col. NEWCOMER. And they only have 30 feet?

Mr. COLE. Yes, sir.

Col. NEWCOMER. And they are satisfied with that?

Mr. COLE. I do not think so.

Col. NEWCOMER. They have not asked the Government for any increase?

Mr. COLE. No, sir.

Col. NEWCOMER. The Government has a channel in there, and we had a hearing on that matter some time ago and they did not ask for anything more than 30 feet.

Mr. COLE. I think there is hardly a hearing in reference to bridge construction and bridge repairing and development over there that does not suggest that the time is near at hand when they have to have more water.

Col. NEWCOMER. Is not the desire for 35 feet in Boston on account of the fact that they want to load boats at those piers that draw more than the colliers?

Mr. COLE. Mr. Hamlin told me three or four weeks ago that they would need it to accommodate some of their larger colliers.

Col. NEWCOMER. For those colliers in existence?

Mr. COLE. They have one now that has to come in on high tide.

Col. NEWCOMER. The biggest we have heard of is about 28½ feet.

Mr. COLE. There is a bowlder there on the outside that would cost about $20,000 to remove, and they have been asking us to remove it, and they have to have a partial tide in order to feel safe in coming in there.

Mr. BLODGETT. So that I understand your opinion is that the Government should take and equip and operate this canal?

Mr. COLE. It is. I think there is no other way to have it properly developed.

Mr. BLODGETT. Do you come down here at the request of the Governor of Massachusetts?

Mr. COLE. Well, not at this particular time, but the Governor of Massachusetts has approved very strongly this proposition, and I came originally at his request

Mr. BLODGETT. And you appeared before the Senate Committee?

Mr. COLE. Yes, sir.

Gen. ABBOT. Is it, then, your opinion that the profit to be expected from operating that canal as a privately owned general utility would not be sufficient to enable the company to make the canal what it should be and still pay its stockholders?

Mr. COLE. I should not suppose it would ever pay in that way, any more than most public service of the sort pays in dollars and cents.

Gen. ABBOT. That is why you recommend Government ownership?

Mr. COLE. Yes.

Gen. ABBOT. That it has got to be run as a losing investment?

Mr. COLE. No, sir. I do not like to use that word "a losing investment," because I think it would be a very heavy paying investment, but it would not be an investment that paid directly. There would be shown an operating loss, just as there is in most public service corporations.

Gen. ABBOT. But the indirect——

Mr. COLE (interposing). The indirect would be very heavy.

Gen. ABBOT. The distribution of those indirect profits in your mind, where would they accrue?

Mr. COLE. I do not believe that you can manufacture 65 per cent of a product as important as woolen goods or cotton goods or boots and shoes, consumed by the public of the United States, in any particular locality where any saving that goes into the manufacture does not reach the entire public that consumes, namely, all the people of the United States, to the extent of 60 odd per cent.

Mr. BLODGETT. Is that the theory on which the Commonwealth of Massachusetts has been proceeding for a number of years for Commonwealth ownership of docks and dry docks and so forth?

Mr. COLE. Absolutely. Our dry dock will lose to the Commonwealth a great deal of money when we are obliged to operate it. It was recognized that it would when we started out to build it, but it was built exactly on the theory that I suggest the Government should take over and operate this canal, that it would be of service to the entire country and Massachusetts might well help in that way by bringing shipping and having it properly served in her harbors.

Mr. BLODGETT. You had a not dissimilar experience with the Commonwealth pier, as I recollect?

Mr. COLE. Without boasting at all, I am very glad to say that we have more than trebled the income of the Commonwealth pier by a proper operation of it.

Mr. BLODGETT. If there are no more questions, I thank you very much.

STATEMENT OF MR. EDWARD PAGE, VICE PRESIDENT OF THE NEW ENGLAND FUEL TRANSPORTATION CO., BOSTON, MASS.

Mr. BLODGETT. You are vice president of the New England Fuel Transportation Co.?

Mr. PAGE. Yes.

Mr. BLODGETT. And vice president of the Boston Tow Boat Co.?

Mr. PAGE. The Boston Tow Boat Co. was absorbed by the New England Fuel Transportation Co. a year ago.

Mr. BLODGETT. And your company is in the coal and the coal transportation business?

Mr. PAGE. Yes.

Mr. BLODGETT. And to what extent between southern ports and New England?

Mr. PAGE. We handle between 300,000 and 350,000 tons of coal a month. We own five seagoing tugs and 12 or 13 harbor tugs, about 20 barges, and 6 colliers; in addition to which we charter in the market barges, tugs, and steamers as our coal requirements justify.

Mr. BLODGETT. What is the total coal consumption in New England north of the cape?

Mr. PAGE. Mr. Stowell, the fuel administrator, computed that our requirements for 1918 would be 30,000,000 tons, and his estimate was somewhat less than the commercial people figured it. The administration in Washington approved of the 30,000,000-ton estimate, which was divided into 10,000,000 tons all rail and 20,000,000 tons water-borne coal, of which approximately 12,000,000 tons will go north of Cape Cod, and 8,000,000 to Providence and the Sound ports.

Mr. BLODGETT. How much of the 10,000,000 tons all rail could come by water just as well, and relieve the railroads, if there were facilities?

Mr. PAGE. Why, I should say 25 per cent could come. That would be a question of the relative advantages of a back haul from the tidewater ports versus the haul through the rail gateways. That is a question which is very difficult to answer directly, unless a study of the conditions is made, but I should say 25 per cent could come and come more cheaply by that method.

Mr. BLODGETT. And would that amount go north of the cape?

Mr. PAGE. I should think a part of it, possibly 50 per cent, because the greater portion of that coal would go to New York piers, and coal from the New York piers would logically move to a point south of the cape.

Mr. BLODGETT. So there would be coming north of the cape somewhere between 12,000,000 and 15,000,000 tons?

Mr. PAGE. I should say possibly not as high as 15,000,000.

Mr. BLODGETT. I say, between 12 and 15?

Mr. PAGE. Yes.

Mr. BLODGETT. You have been familiar with this Cape Cod Canal since it started?

Mr. PAGE. Yes.

Mr. BLODGETT. You knew it when it opened?

Mr. PAGE. Yes. We have done a lot of business there.

Mr. BLODGETT. In your opinion, has that canal ever been in an efficient state for the uses to which it should be put?

Mr. PAGE. Not in any way; no, sir.

Mr. BLODGETT. And can be put?

Mr. PAGE. No, sir.

Mr. BLODGETT. What do you say as to whether or not the Government should take that canal and make it efficient and own it and operate it?

Mr. PAGE. Well, there is no question in my mind, from the commercial standpoint, that 12,000,000 tons of coal would pass through that gateway. Now, I do not think that one-tenth of it—I am just guessing now; the canal records would show—are passing through it.

Col. NEWCOMER. About one-fifth approximately, I think.

Mr. BLODGETT. And you think the whole 12,000,000 tons would pass through?

Mr. PAGE. It is the logical gateway for it to pass through if it were sufficiently deepened and widened, so as to permit the steamers; that is the trend of the trade, the colliers.

Col. NEWCOMER. Did you tell us to what extent you used the canal?

Mr. PAGE. Very little. We have some light-draft barges that pass through, within the discretion of the master of the tow.

Col. NEWCOMER. Is all of your trade between Boston and south of the Delaware, for instance?

Mr. PAGE. The bulk of our coal is handled from Hampton Roads, from Baltimore and Hampton Roads piers to Boston.

Col. NEWCOMER. So your barges are all seagoing barges?

Mr. PAGE. All of them, and we have 1,500-ton barges that will draw 16 or 17 feet, and other barges that draw 21 or 22, and then our colliers run up to 24 to 25 feet.

Col. NEWCOMER. Your smaller barges could go through there, could they not?

Mr. PAGE. Yes.

Col. NEWCOMER. Why don't they?

Mr. PAGE. When a tow is made up at Hampton Roads it is made up of a large barge and generally one small barge. Tows are taken when they can. It is very rare that a tow will be made up all light-draft barges. It is not usual to drop the light barge and then go down around the shoals with the larger barge.

Col. NEWCOMER. On high tide they could go through with any of your barges?

Mr. PAGE. I suppose that it is physically possible, but there is always the element of risk and a very large element of risk. The masters of the tows are confronted with the accidents that they have had and the difficulties of navigation, and it is up to them to proceed safely, and they are not going to take any chances unless they are given as near a means of safe passage as can be given them.

Col. NEWCOMER. Of course, they recognize the fact that there are considerable risks outside, do they not?

Mr. PAGE. Well, a master had rather be in an open sea than in a narrow passageway.

Col. NEWCOMER. And do they usually go over the Pollock Rip Shoals?

Mr. PAGE. Yes. I do not believe that in our experience—I do not recall of but one instance that we have had any barges destroyed.

Col. NEWCOMER. You have lost barges around Boston?

Mr. PAGE. No, sir.

Col. NEWCOMER. How long have you been in the business?

Mr. PAGE. Since 1907 or 1908.

Col. NEWCOMER. What is the draft of your colliers?

Mr. PAGE. Our colliers draw from 21 feet. That is the small class, 2,000 tons. Our large colliers draw 24½ feet loaded. They vary slightly with the amount of load.

Col. NEWCOMER. I thought that you were going to put in some last year drawing about 28 feet?

Mr. PAGE. We should have done so, but the prices rose so precipitately that we did not consider it a good investment. We have got two colliers, the Ulysses and the Achilles, that draw 28 or 29 feet. I think they are the deepest draft colliers that now enter Boston.

Capt. CROWLEY. Some of these old Norwegian ships that come in there now draw 28.

Col. NEWCOMER. You put those into other trade?

Mr. PAGE. No; they are not passing through the canal. They are going outside.

Col. NEWCOMER. I thought you said that your deepest draft colliers are only 24½ or 25 feet.

Mr. PAGE. Oh, no. They are in the coal trade, but they go outside and not through the canal.

Mr. BLODGETT. If the canal were 25 feet at mean low water all the way, and if some of the places were widened, which would be the same as straightening, would it increase the amount of your use of the canal?

Mr. PAGE. Yes.

Mr. BLODGETT. How much—your company's use, I mean?

Mr. PAGE. It would unquestionably increase the use to the extent of our entire barge fleet and probably our small steamers. As to whether 25 feet at low water would allow our colliers to go through, I would prefer to leave that to our masters.

Mr. BLODGETT. What would you consider essential in order to secure a substantial use by your company?

Mr. PAGE. I should think that a 25 foot mean low water would permit 75 per cent.

Mr. BLODGETT. And what width?

Mr. PAGE. One hundred feet.

Mr. BLODGETT. Wider than it is now?

Mr. PAGE. The present width with 25 foot mean low water would permit a very large substantial increase. Just to what extent I would have to guess. It might be 75 per cent.

Col. NEWCOMER. You think you would take your 22-foot barges through if you had a width of 100 feet?

Mr. PAGE. Yes. If you had 25 feet low water; but obviously you would not get the efficiency at 100 feet that you would at 200.

Col. NEWCOMER. Have you got the expert opinion of your masters about that proposition, under what conditions they would advise going through there?

Mr. PAGE. I have not talked with them recently. They are the ones to answer that question.

Col. NEWCOMER. And you are not in a position to say just what their purpose would be?

Mr. PAGE. No. I am not in a position to answer that.

Mr. BLODGETT. Have you any steamers that would not use the canal on a 35-foot depth at mean low water, provided the canal was 200 feet wide?

Mr. PAGE. I should expect them to use it. I would not want to answer that question definitely, because that is a marine operating question, and our marine superintendent should be the one to answer it, but I should expect it to be used if the canal was put in that condition.

Mr. BLODGETT. From your experience with the canal, do you think that the canal can be put in such a condition, or will be put in such a condition, by private ownership?

Mr. PAGE. Judging it from a commercial standpoint, if I were the private ownership I would not do it, and I can not see why they would do it.

Col. NEWCOMER. Except to get some return on the investment?

Mr. PAGE. Well, they may have to lay out so much that the return on the investment would be nil. That is a question of figures and how much it will cost.

Mr. BLODGETT. Then, as I understand you, you are in favor of Government ownership of the canal?

Mr. PAGE. I am in favor of the Government owning waterways of that character as a general principle. I do not think it is a place for private capital.

Mr. BLODGETT. I think that is all, and we thank you very much.

STATEMENT OF CAPT. EUGENE E. O'DONNELL, MANAGER OF THE TRANSPORTATION DIVISION OF C. H. SPRAGUE & SON, BOSTON, MASS.

Mr. BLODGETT. Your name is Eugene E. O'Donnell?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. You are from Boston?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. And what is your business now, Captain?

Capt. O'DONNELL. Manager of the transportation division of C. H. Sprague & Son.

Mr. BLODGETT. And you have been steamboat inspector, supervising inspector for the Massachusetts district?

Capt. O'DONNELL. For the New England district.

Mr. BLODGETT. For the New England district?

Capt. O'DONNELL. Yes, sir.

Mr. BLODGETT. And before that you were a master mariner?

Capt. O'DONNELL. Yes, sir.

Mr. BLODGETT. And you have navigated what kind of vessels?

Capt. O'DONNELL. Such vessels as the Bunker Hill and the Massachusetts and the Harvard and Yale.

Mr. BLODGETT. And you navigated them outside—around through the slough?

Capt. O'DONNELL. Altogether, yes.

Mr. BLODGETT. Have you ever navigated through the canal?

Capr. O'DONNELL. No; not as master.

Mr. BLODGETT. Not as master. You have been through the canal?

Capt. O'DONNELL. As a passenger.

Mr. BLODGETT. As a passenger? How much tonnage of coal does C. H. Sprague & Son use in its New England business?

Capt. O'DONNELL. I should have to approximate that; but I should say somewhere in the vicinity of 2,000,000 tons a year.

Mr. BLODGETT. And how much of that goes north of the cape?

Capt. O'DONNELL. About 75 per cent of it.

Mr. BLODGETT. How many vessels do they operate?

Capt. O'DONNELL. The vessels that we own, charter, and act as agents for, I should say 15.

Mr. BLODGETT. And of what sizes?

Capt. O'DONNELL. Vessels that will carry from 2,000 to 7,500 dead-weight tons.

Mr. BLODGETT. Do those vessels use the canal now?

Capt. O'DONNELL. No.

Mr. BLODGETT. Any of them?

Capt. O'DONNELL. Not at the present time.

Mr. BLODGETT. How long since they have used it?

Capt. O'DONNELL. Well, we have not used it since we lost our steamer Bay Port about two years ago.

Mr. BLODGETT. That was lost in the canal?

Capt. O'DONNELL. In the canal, yes.

Mr. BLODGETT. That vessel was drawing how much, do you remember, when she went in?

Capt. O'DONNELL. I do not remember accurately; I should say about 18 or 19 feet.

Mr. BLODGETT. About 18 feet—6, was it not?

Capt. O'DONNELL. About that.

Mr. BLODGETT. That was the case that I referred to, in which we showed at the trial that there were two shoal spots in the canal about a mile apart, where there was 18 feet at one of those places and 18½ feet or 19 feet in the other place.

Capt. O'DONNELL. I don't recall your testifying to that.

Mr. BLODGETT. But it is a fact that was the case.

Capt. O'DONNELL. It is a fact.

Col. NEWCOMER. That is not the case, where they struck upon a portion of a dam that had not been removed, is it?

Mr. BLODGETT. No; that was the first case. That was the case of the Watuppa.

Col. NEWCOMER. Oh, yes.

Gen. HAINS. What was the cause of this accident?

Mr. BLODGETT. This was the last case, Colonel, the case of the Bay Port.

Col. NEWCOMER. This boat sheered, did she not, and got on to the bank?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. Yes; she sheered by reason of "smelling bottom" over the shoal spot, and got out of control and struck the bank before they could control her; and she did it on two occasions.

Col. NEWCOMER. Was she going against or with the current?

Capt. O'DONNELL. I do not recall. Probably Mr. Blodgett knows about that.

Mr. BLODGETT. She was going with the current.

Col. NEWCOMER. Under her own power?

Mr. BLODGETT. Yes; and with a tug ahead to steady her. Now, Captain, what do you say in reference to the advisability of the Government taking and owning this waterway and putting it in proper condition and keeping it so?

Capt. O'DONNELL. I should say that the Government should do that. Speaking aside from the standpoint of the operating manager of a transportation company, and looking at it from the standpoint of the position I formerly occupied, that of supervising inspector of steam vessels, safety to life by going through the canal I should say would be increased at least 50 per cent.

Mr. BLODGETT. Over going around the shoals?

Capt. O'DONNELL. Over going around the shoals. From the records and reports I have read, about 40 per cent of the year it is thick fog at Pollock Rip or from Chatham to Shovelful; and certainly the number of northeast and southeast storms must be, together with all the easterly weather we have there, at least 20 per cent more. That may be only an approximate figure; but if my memory serves me, at least 40 per cent of the time it is thick fog at the Pollock Rip Shoals.

Mr. BLODGETT. You are familiar with the Nantucket Shoal route and the slough?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. Which do you think is the more dangerous avenue for traffic, the canal or Pollock Rip Slough?

Capt. O'DONNELL. I think, even at the present time, the canal is safer than Pollock Rip.

Mr. BLODGETT. And is that outside of submarines?

Capt. O'DONNELL. Outside of submarines, yes; marine dangers only.

Mr. BLODGETT. You are familiar with the locality?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. If you go around the cape, do vessels have to go just where this submarine was last Sunday?

Capt. O'DONNELL. There is no way of avoiding it.

Mr. BLODGETT. They have to go in just that direction?
Capt. O'DONNELL. Yes.
Mr. BLODGETT. In other words, that tug and barges were following the regular, main route around the cape?
Capt. O'DONNELL. They were exactly in the track of all inbound vessels, off Chatham.
Mr. BLODGETT. That is where all coastwise vessels have to go, north and south, unless they use the Cape Cod Canal?
Capt. O'DONNELL. Yes.
Mr. BLODGETT. If they used the Cape Cod Canal, would they go anywhere near that locality?
Capt. O'DONNELL. No; they would be quite a number of miles inside of that.
Mr. BLODGETT. Is there any way that a submarine could go in deep water so as to get into the route a vessel would traverse if she went through the Cape Cod Canal?
Capt. O'DONNELL. No, sir; I think not; for the reason that Stellwagen Bank, which runs up toward Thatcher's Island, across the middle of Massachusetts Bay, has as little as 9 fathoms of water on it—I have heard it said there was as little as 6 fathoms; and that is hardly sufficient depth for a submarine, I should imagine, to submerge without being liable to be captured, or without leaving a track for the vessel seeking it.
Mr. BLODGETT. Do you know, as a matter of fact, that the Navy Department ordered the port of Boston closed a while ago except to vessels coming in through the canal or going out through the canal?
Capt. O'DONNELL. I don't know as to that.
Col. NEWCOMER. You say the canal, even in its present condition, is safer than the Pollock Rip?
Capt. O'DONNELL. I should say so.
Col. NEWCOMER. Why don't you use the canal, then?
Capt. O'DONNELL. Simply because there isn't sufficient depth there for our steamers.
Col. NEWCOMER. Well, it isn't safer then, is it?
Capt. O'DONNELL. I am speaking purely from the standpoint of safety to life, not from the standpoint of safety to the vessel. It might be true that a vessel would touch bottom in the canal, but it is not true that there would be loss of life.
Mr. BLODGETT. What would you consider an essential change in the canal in order to put it into such condition that you would recommend taking your boats through?
Capt. O'DONNELL. It should be not less than 35 feet deep.
Mr. B ODGETT. What is the deepest draft you carry?
Capt. O'DONNELL. Our two chartered steamers, the Noyes and Pierce, draw 25 or 26 feet of water.
Mr. BLODGETT. They are Crowell & Thurlow boats, are they not?
Capt. O'DONNELL. Yes; but chartered by our company.
Col. NEWCOMER. And you think a depth of 35 feet is essential to take those boats through?
Capt. O'DONNELL. Yes; that depth of water and a width on the bottom of at least 200 feet.
Col. NEWCOMER. Do you know of any place in the world where they try to provide as much as 9 feet of water under a boat in a navigable channel through still water?
Capt. O'DONNELL. No; I do not.
Col. NEWCOMER. Then why do you ask for it?
Capt. O DONNELL. The point is this: As that vessel proceeds through the water, she is bound to drag down.
Col. NEWCOMER. She would not drag much at the slow speed at which she would go through there, would she?
Capt. O'DONNELL. Perhaps not very much.
Col. NEWCOMER. Going at not more than a 5 or 6 knot speed?
Capt. O'DONNELL. But there are other vessels operating in the coal trade, that draw 28 or 29 feet.
Col. NEWCOMER. I am just asking you what depth you think would be necessary for your boats?
Capt. O'DONNELL. We could actually get along with 30.
Col. NEWCOMER. So you think you would have to have at least five feet under your boat?
Capt. O'DONNELL. Yes.
Col. NEWCOMER. Why would not 25 feet of water do, and then you could go through at high tide, which would give you five feet more?
Capt. O'DONNELL. That would do well enough, but the canal would not be efficient under that arrangement.
Col. NEWCOMER. Simply because they would have to wait for the tide?

Capt. O'DONNELL. We would have to wait for the tide and we would save time by going outside.

Col. NEWCOMER. That would depend upon what you would lose outside because of fogs and storms, would it not?

Capt. O'DONNELL. Yes, there is fog sometimes.

Mr. BLODGETT. To bring it to reasonable efficiency, you would want it deepened to what extent?

Capt. O'DONNELL. For our vessels, at least 5 feet; that is, 30 feet for our vessels, and for other vessels 35 feet.

Col. NEWCOMER. Then if the canal were maintained at a depth of 25 feet and widened to 200 feet, you would not advise sending any of your boats through?

Capt. O'DONNELL. If it were widened to 200 feet?

Col. NEWCOMER. Yes.

Capt. O'DONNELL. I should advise sending through the smaller boats that draw anywhere from 18 to 22 feet.

Mr. BLODGETT. But you would not advise sending through anything that draws over 22 feet?

Capt. O'DONNELL. No, a vessel really should have at least five feet of water under her bottom.

Mr. BLODGETT. Why?

Capt. O'DONNELL. Because she is bound to feel the bottom as she proceeds.

Mr. BLODGETT. To "smell" the bottom?

Capt. O'DONNELL. Yes, "smell" the bottom.

Mr. BLODGETT. And then that causes her to lose control of her rudder?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. And to sheer around?

Capt. O'DONNELL. She is bound to sheer, under those conditions.

Col. NEWCOMER. What would be your advice as to taking a boat through with reference to the current; would you go through irrespective of the direction of the current, or would you go with it only?

Capt. O'DONNELL. My opinion regarding the tide in the canal or the current in the canal was, that a head tide was the favorable or better tide to operate the larger vessels; but I found by talking to some of the captains who had experience in the canal that a fair tide was really the best.

Col. NEWCOMER. She is more apt to sheer on an opposing tide?

Capt. O'DONNELL. More apt to sheer; and if you get the tide on either bow she is bound to go on the bank.

Mr. BLODGETT. But if you have a tug ahead of you to help break the sheer, that would assist, would it not?

Capt. O'DONNELL. It would help tremendously.

Mr. BLODGETT. If the canal was maintained at a depth of 25 feet at mean low water, with 150 or 200 feet width on the botton, how much of the coastwise shipping do you think would be accommodated and would use it?

Capt. O'DONNELL. At 25 feet, I doubt if more than 50 per cent.

Mr. BLODGETT. And at 30 feet?

Capt. O'DONNELL. At 30 feet you would perhaps get 75 per cent of the shipping.

Mr. BLODGETT. And at 35 feet?

Capt. O'DONNELL. You would get the entire shipping on the coast.

Col. NEWCOMER. Is not a much larger percentage than 50 per cent of the coal handled in barges that do not exceed 22 or 23 feet draft?

Capt. O'DONNELL. It is only the very large barges that draw more than 20 feet.

Col. NEWCOMER. I say, is it not a fact that very much more than half of the coal that passes north around the Cape is handled in barges that draw less than that?

Capt. O'DONNELL. Yes, but I have in mind the need of having ample draft under a vessel's bottom. Take a vessel drawing 20 feet, of course she would have to have 25 feet. And the large colliers—I doubt if there are any of the colliers, except the very small ones—and they are few in number—that draw less than 21 or 22 feet of water.

Mr. BLODGETT. When you were supervising inspector, did you give certificates to certain vessels to navigate between Boston and New York only by way of the Cape Cod Canal?

Capt. O'DONNELL. Yes, we did.

Mr. BLODGETT. Why did you do it?

Capt. O'DONNELL. Because we felt it was safer for the vessels to go that way, due to weather conditions principally.

Mr. BLODGETT. How many of the vessels that are now being used for carrying coal and other commodities between southern ports and New England are there that are of that class of vessels; tugs, barges, and other craft of that kind—how much tonnage capacity do you estimate?

Capt. O'DONNELL. I should say perhaps 75,000 to 100,000 tons a month, in the smaller barges.

Mr. BLODGETT. And those could not go around the Cape?

Capt. O'DONNELL. No. I may have put that too high; I am approximating that, and I should rather have that statement made or that question answered by some of the gentlemen who are operating that type of vessel.

Mr. BLODGETT. The tide through the canal runs straight, the current?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. Are you familiar with the tide at the entrances to the canal at all, or the current?

Capt. O'DONNELL. Not very much.

Mr. BLODGETT. Not very much. In your judgment, would the canal, to be efficient for the coastwise traffic, have to be wide enough for double the traffic passing each way, or would you have passing places in the canal?

Capt. O'DONNELL. I should advocate a passing place, because of course it would take a tremendous amount of money to have a two-way canal.

Mr. BLODGETT. And where would that passing place be? Would it be in the middle or about the middle?

Capt. O'DONNELL. I should say somewhere in the middle.

Mr. BLODGETT. About how long should that passing place be, in your opinion?

Capt. O'DONNELL. Well, it should be of sufficient length to tie up four or five vessels at a time.

Mr. BLODGETT. Would you advocate having an anchoring basin inside the Sandwich Breakwater?

Capt. O'DONNELL. I think it would be best to have a pocket in the canal for the boats to tie up, rather than anchoring outside.

Mr. BLODGETT. Inside the breakwater?

Capt. O'DONNELL. Inside the breakwater.

Col. NEWCOMER. What would you consider sufficient width to permit of two-way traffic?

Capt. O'DONNELL. It would be purely an approximation with me. Looking at it from the sailor's standpoint, I should not want less than 400 feet; 500 feet would really be necessary.

Mr. BLODGETT. For an anchorage place?

Capt. O'DONNELL. No, for the moving of two large vessels through the canal, coming head and head.

Mr. BLODGETT. So that, even with a widening to 200 feet, in order to pass you would have to tie up one boat?

Capt. O'DONNELL. That is my impression; yes, sir. You could pass with the smaller vessels, of course, in 200 feet.

Mr. BLODGETT. Surely. What I had in mind particularly, of course—because that is the principal traffic—is the barge traffic where you have a barge in tow of a tug.

Capt. O'DONNELL. Yes.

Mr. BLODGETT. And to have two of those pass safely you think would be required more than 200 feet?

Capt. O'DONNELL. I should say so.

Mr. BLODGETT. You know the fleet of Crowell & Thurlow?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. How do their vessels run in draft?

Capt. O'DONNELL. The majority of the vessels, two of which we have chartered, I should say draw about 25 or 26 feet of water.

Mr. BLODGETT. So that a 35-foot channel, or even a 30-foot channel, would accommodate all their vessels?

Capt. O'DONNELL. A 30-foot channel would accommodate them; but on the low tide——

Mr. BLODGETT (interposing). You mean on the low course of tides?

Capt. O'DONNELL (continuing). On the low course of tides they would be pretty close to the bottom.

Mr. BLODGETT. But a 35-foot channel would accommodate them safely?

Capt. O'DONNELL. They would be perfectly safe under all conditions; yes, sir.

Mr. BLODGETT. As I understand you, you said you thought practically all the coastwise vessels would use the canal if it were——

Capt. O'DONNELL (interposing). If it were 200 feet wide and 35 feet deep.

Mr. BLODGETT. If it were 200 feet wide and 35 feet deep?

Capt. O'DONNELL. Yes.

Mr. BLODGETT. Are the bridges wide enough for those vessels to go through?

Capt. O'DONNELL. I should say they were; yes, sir—I should say they were.

Mr. BLODGETT. I think that is everything I have to ask the captain.

STATEMENT OF CAPT. JOHN G. CROWLEY, PRESIDENT OF THE CONSOLIDATED COASTWISE CO. BOSTON, MASS.

Mr. BLODGETT. Your name is John G. Crowley?
Capt. CROWLEY. Yes.
Mr. BLODGETT. Captain, I guess you know all these men or most of them?
Capt. CROWLEY. I guess most of them know me.
Mr. BLODGETT. You are president of the Coastwise Transportation Co.?
Capt. CROWLEY. Yes, sir.
Mr. BLODGETT. And you are president of the Coastwise——
Capt. CROWLEY (interposing). Consolidation Coastwise Co.
Mr. BLODGETT. Of the Consolidation Coastwise Co.?
Capt. CROWLEY. Yes.
Mr. BLODGETT. That is the floating equipment of the Consolidation Coal Co.?
Capt. CROWLEY. Yes, sir.
Mr. BLODGETT. How much tonnage, in your various fleets, do you have?
Capt. CROWLEY. In our barge fleet now we have 4 big ocean-going tugs and 13 barges.
Mr. BLODGETT. And of what capacity and draft?
Capt. CROWLEY. From 1,700 to 2,800.
Mr. BLODGETT. And what draft?
Capt. CROWLEY. From about 18 feet to 22 or 23—that is, the barges.
Mr. BLODGETT. Now, your steamer fleet?
Capt. CROWLEY. We have in our steamer fleet taking our own boats and the boats we are handling for the Government——
Mr. BLODGETT (interposing). I will come to those later. Take your own boats.
Capt. CROWLEY. Take our own boats, at the present time we only have five of our own boats in the service; the Government has the balance of them.
Mr. BLODGETT. Take your own fleet irrespective of the Government, whether the Government has them or not.
Capt. CROWLEY. We have nine big boats; the smallest one carries 6,000 tons deadweight.
Mr. BLODGETT. And the largest carries how much?
Capt. CROWLEY. The largest carries 9,000.
Mr. BLODGETT. And what are the limits of the draft?
Capt. CROWLEY. The smallest boats draw about 24 feet and the big boats draw 29, 28½, 29, on the coast, loaded with coal.
Mr. BLODGETT. Those were all built for colliers?
Capt. CROWLEY. They were all built for colliers, for New England; they only come there
Mr. BLODGETT. And are all colliers?
Capt. CROWLEY. All colliers.
Mr. BLODGETT. How much coal, prior to the Government taking your vessels, were your two fleets carrying to New England ports—the best estimate you can give?
Capt. CROWLEY. I should say in the neighborhood of 4,000,000 tons.
Mr. BLODGETT. A year?
Capt. CROWLEY. Yes; four to five million.
Col. NEWCOMER. Does that go mainly north of the cape, or partly to the Sound?
Capt. CROWLEY. That all went to Boston and Portland.
Col. NEWCOMER. North of the cape?
Capt. CROWLEY. Yes; to the north of the cape.
Mr. BLODGETT. You and your brother, Capt. Arthur L. Crowley, are acting for the Shipping Board in New England?
Capt. CROWLEY. Yes, sir.
Mr. BLODGETT. And you have charge of the handling of how many vessels for the Fleet Corporation?
Capt. CROWLEY. In our own company we have 18 or 20 and in the Emergency Fleet, the other office, they have in the neighborhood of 75 to 100: about 90, I think, of their Emergency Fleet boats. That is all assigned to New England now.
Col. NEWCOMER. Is that all in the coal trade?
Capt. CROWLEY. Most of them are in the coal trade; some of them were cotton, some sugar; but most of them are in the sugar and the coal trades.
Col. NEWCOMER. How much do their drafts run?
Capt. CROWLEY. Their drafts run anywhere from 20 to 28 feet. These Dutch ships—you are familiar with those—most of these old Dutch ships draw anywhere from 25 to 28 feet.
Col. NEWCOMER. Are the others that belong to the Emergency Fleet new American boats built under our new program?

Capt. CROWLEY. There are a great many boats coming down from the Lakes that draw about 22 feet and that carry about 3,000 or 3,500 dead-weight, or are supposed to.

Mr. BLODGETT. You have been familiar with the Cape Cod Canal since it started?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. And you are on the maritime committee of the Chamber of Commerce of Boston?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. And you have been in touch with all the maritime affairs in Boston and New England for a great many years, have you not?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. What do you say as to the advisability of the Government taking and owning and fitting this canal to accommodate coastwise traffic and also Government traffic in Government vessels?

Capt. CROWLEY. I think it ought to be taken over by the Government and widened, and the depth increased, and the curves straightened as much as they could straighten them; I don't say you could make a straight waterway, but you could cut off some corners there that would make it a little straighter than it is to-day.

Mr. BLODGETT. How much depth do you think it should have to accommodate properly the entire coastwise traffic going north of the Cape from any southern port?

Capt. CROWLEY. It should not be less than 30 feet; 35 feet would be better.

Mr. BLODGETT. And what width of bottom?

Capt. CROWLEY. It should be not less than 200 feet.

Col. NEWCOMER. Do you think there is the same need of providing that inside passage for the steamers that there is for the barge traffic?

Capt. CROWLEY. Well, it would be better and it would be used more by barge traffic than it would by the steamers; but I think steamers would use it now a great deal more often if they could go through.

Gen. ABBOT. If they were to put all the steamers through, would not the barge traffic be almost cut out in a 200-foot canal?

Capt. CROWLEY. No, I don't think so.

Gen. ABBOT. The steamers would have to run more or less on schedule, all the passenger steamers?

Capt. CROWLEY. Yes, the steamers would go through at any time of tide.

Gen. ABBOT. Why couldn't barges go through at any time of tide?

Capt. CROWLEY. Well, I suppose—you take a strong tide against the barges it is pretty hard work to pull more than one through; it would take a good powerful tug.

Gen. ABBOT. Do you think a 200-foot canal could be used for two-way traffic?

Capt. CROWLEY. I think it could, but you would have to use considerable caution, you know, in passing each other.

Gen. ABBOT. How about the suction of a steamer going by a tow of barges in a waterway of that limited width, even if it were 35 feet deep?

Capt. CROWLEY. Do you mean in the case of an overtaking vessel?

Gen. ABBOT. I mean the suction between two vessels passing each other.

Capt. CROWLEY. I don't think there would be so terribly much suction. If a steamer came up on a tow of barges, or two steamers were coming along, one overtaking the other, there is quite a little suction, there is quite an attraction, to suck up to each other.

Mr. BLODGETT. But that is only when one is overtaking the other?

Capt. CROWLEY. Yes, when one is overtaking the other.

Mr. BLODGETT. Meeting head and head there is none?

Capt. CROWLEY. Meeting head and head there is no suction.

Mr. BLODGETT. It is only in the case of an overtaking vessel?

Capt. CROWLEY. Only in the case of an overtaking vessel. If that canal was made 200 feet wide on the bottom, I think vessels could pass each other there very safely, excepting the Eastern Steamship boats, when they go through; but that only takes a short time. But ordinary freight ships coming along I think could pass each other very well.

Gen. ABBOT. They would have to slow down, probably?

Capt. CROWLEY. Yes, they would have to slow down somewhat.

Mr. BLODGETT. In your judgment, if the canal were deepened and widened as you have stated, would that be a safer and better passage than the Pollock Rip Slough?

Capt. CROWLEY. Yes; we wouldn't use the Pollock Rip Slough with any of our boats then, except a small amount.

Mr. BLODGETT. In going outside do your vessels have to pass where the submarines have been?

Capt. CROWLEY. We have to go around it.

Mr. BLODGETT. Didn't you own the Norfolk?

Capt. CROWLEY. We owned the Norfolk.

Mr. BLODGETT. And wasn't your captain the one who picked up the crew of a vessel which was submarined?

Capt. CROWLEY. It was the Bristol.

Mr. BLODGETT. The Bristol? Capt. Hart, of the Bristol, picked up the crew of one of the vessels which had been submarined?

Capt. CROWLEY. Yes; the Edward Cole; it was 40 miles off Barnegat, and it was the first submarine that came over. The Bristol saw the schooner blown up, and she picked up the crew, and then the submarine chased her, but she was going so fast that the submarine couldn't catch her, and she went into New York with the crew.

Mr. BLODGETT. How much speed did he get on that boat—running away from that submarine?

Capt. CROWLEY. He got about 16 knots on her; he got about 32 knots in two hours.

Mr. BLODGETT. What is her normal full speed?

Capt. CROWLEY. About 12 or 13 knots.

Gen. ABBOT. What did they do with the safety valve?

Capt. CROWLEY. They opened everything wide open; all the passovers and blower tubes.

Gen. ABBOT. And they put all the crew at work shoveling on coal?

Capt. CROWLEY. They had all the crew of the other ship and they all worked.

Col. NEWCOMER. Do you know anything about this canal? There is considerable current there, of course, at times?

Capt. CROWLEY. Yes.

Col. NEWCOMER. Do you think that boats going in opposite directions would dare reduce their speed sufficiently; might they not lose steerageway in order to pass each other?

Capt. CROWLEY. No; I think they could pass each other going 5 or 6 knots.

Col. NEWCOMER. And with a current of between 3 and 3½ knots?

Capt. CROWLEY. Yes; I think they could do better going that speed, in handling their boats, than if they slowed down more. As soon as you slow your boat down you lose control of it.

Col. NEWCOMER. Do you think that the masters of two boats would take the risk of passing each other—boats, say, of 2,000 tons?

Capt. CROWLEY. I don't think they would get right up on each other at that rate of speed; I think when they got right close to each other they would slow down to 3 knots to get by each other.

Col. NEWCOMER. Do you think they would at all assume the risk of passing each other in that canal?

Capt. CROWLEY. I think they would; I would.

Col. NEWCOMER. Don't you think, then, you could assume the risk of going through, with a 100-foot width, without any other boat in sight?

Capt. CROWLEY. With the present depth?

Col. NEWCOMER. Yes; with a depth of 25 feet.

Capt. CROWLEY. Not with the depth of to-day.

Col. NEWCOMER. With a depth of 25 feet?

Capt. CROWLEY. No; I do not; not with a boat loaded drawing 25 feet.

Col. NEWCOMER. I do not mean that, of course; but some of the boats do not draw more than 21 or 22 feet; and, with the tide there, you could have as much as 26 to 30 feet depth of water; and you know from the tide tables just exactly when you will have that tide there; but still you never propose to use that canal under those conditions?

Capt. CROWLEY. No; everyone got frightened of it; that is all; all my masters, with all these accidents occurring there.

Col. NEWCOMER. Still, notwithstanding their being frightened, you think they would try to pass each other with two boats?

Capt. CROWLEY. I think with a wide canal they would.

Col. NEWCOMER. 200 feet?

Capt. CROWLEY. Yes.

Mr. BLODGETT. By the way, Captain, are you operating the J. H. Devereux now?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. Does she use the canal—light?

Capt. CROWLEY. She does; yes, sir.

Mr. BLODGETT. You saw her, Colonel (Col. Newcomer), going through?

Col. NEWCOMER. Yes; I saw her going through.

Mr. BLODGETT. But she does not use it loaded?

Capt. CROWLEY. No.

Mr. BLODGETT. What does she draw loaded?

Capt. CROWLEY. I think she draws about 20 feet.

Mr. BLODGETT. Is it left to her master to determine whether to use it or not?

Capt. CROWLEY. We never have said anything to him about it.

Mr. BLODGETT. He uses his discretion?

Capt. CROWLEY. Yes. They were all afraid to go through loaded, I know. And we haven't any, light, that have been through the canal.

Mr. BLODGETT. You have the Devereux?

Capt. CROWLEY. I mean, outside of the Devereux. I think our tugs, light, have used it.

Col. NEWCOMER. May I ask why they do not go through, light? Because, then, they are drawing much less than the amount of water there is there.

Capt. CROWLEY. The only reason is, that they got afraid of it, so many accidents happened there. An accident happens to a master, and he is hauled up before the inspectors, so he says, "Well, I would rather take my chances outside," except once in a while we do order a tug to go through; but the captains won't go through unless we give them orders to go through.

Col. NEWCOMER. Have you the slightest doubt about the safety of a tug in going through there?

Capt. CROWLEY. No, sir.

Col. NEWCOMER. Do any of the masters of your tugs have any doubt about that?

Capt. CROWLEY. Yes, they all do. You tell them to go through the Cape Cod Canal, and they stand and look at you.

Col. NEWCOMER. That is very curious.

Capt. CROWLEY. They seem to be afraid of it.

Mr. BLODGETT. Seamen are a peculiar bunch, Colonel.

Capt. CROWLEY. We sent a boat through there this winter to New Bedford, going light, to get some barges. The master hesitated. "Well," he says, "I never have been through there." I said, "You go, and if you can't find your way or if you have any doubt about it when you get to the canal, get a pilot to take you through."

Gen. HAINS. You do not consider the canal in its present condition a success, do you?

Capt. CROWLEY. No sir, I do not.

Col. NEWCOMER. You think it is an unreasoning prejudice or fear on the part of the mariners, or do you concur in their opinion that they should not go through?

Capt. CROWLEY. It is just as I have explained, they have had the accidents there, and they are afraid.

Col. NEWCOMER. I say, is that an unreasonable fear or is it sound judgment?

Capt. CROWLEY. I think it is sound judgment.

Col. NEWCOMER. Sound judgment?

Capt. CROWLEY. Yes, sir. I think I would rather go outside, if I had a tow of barges, than to go through the canal.

Mr. BLODGETT. If you had to go around with your loaded steamer, outside, would you naturally go back the same way, or would you naturally go back through the canal?

Capt. CROWLEY. I would naturally go the same way, in the present condition of the canal. We had orders from Boston and Washington yesterday—this was the direct order—that every vessel should go through the canal. And we laughed at it. They said, "Would you put the Hampden through the canal?" I said, "No, I wouldn't; she wouldn't go through loaded, and I wouldn't send her through light, I would rather take the chances of a submarine back of Cape Cod than run her through the canal." She draws 17 feet loaded and 16 feet light.

Gen. ABBOT. How long is she?

Capt. CROWLEY. A little over 400 feet long. She has one wheel, a turbine.

Mr. BLODGETT. As I understand you, if the canal were put in the condition you have stated, of 35 feet depth and 200 feet width, all your boats would use it?

Capt. CROWLEY. They all would use it most of the time; yes, sir.

Mr. BLODGETT. Could your brother come down here to-day?

Capt. CROWLEY. No, sir, he could not.

Mr. BLODGETT. He represents the Shipping Board directly, as I understand.

Capt. CROWLEY. Yes.

Mr. BLODGETT. Did he send a letter down to me?

Capt. CROWLEY. Yes.

Mr. BLODGETT. Is that it?

Capt. CROWLEY. Yes.

Mr. BLODGETT. I am going to offer this letter from Capt. Arthur L. Crowley, Capt. Crowley's brother.

Mr. BLODGETT. How much of the coal going to New England, in your judgment, would be carried through the canal if it were widened and deepened and kept in condition by the Government?

Capt. CROWLEY. I think over two-thirds of it.

Mr. BLODGETT. Do you think it would relieve the all-rail route?

Capt. CROWLEY. Yes.

Mr. BLODGETT. To what extent, approximately?

Capt. CROWLEY. Well, we figure that if the canal was in efficient state we could carry 25 per cent more coal to New England than what we can to-day.

Mr. BLODGETT. Twenty-five per cent more?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. Your vessels alone would carry that?

Capt. CROWLEY. That much more than what they do to-day.

Mr. BLODGETT. If they used the canal both ways?

Capt. CROWLEY. Yes. You see yesterday in the Vineyard there were eight steamers, eight loaded colliers, and I forget how many tows of barges that were held up in the Vineyard and had been held up there since Sunday, and they had no orders to leave up to last night.

Mr. BLODGETT. On what account were they held up?

Capt. CROWLEY. On account of the submarine. They were held up there by the Government waiting for a convoy to bring them to Boston. Probably this morning, if they did not start last night there are 20 steamers held there.

Mr. BLODGETT. Is there any way a submarine could get at a vessel that was going up through the canal on that route—at least until after she got into Massachusetts Bay?

Capt. CROWLEY. I don't think they would come in there and take their chances in the bay.

Gen. ABBOT. How about the situation off Point Judith and in Buzzards Bay?

Capt. CROWLEY. They wouldn't be very apt to come in there; the water is shallow, and they would have to stay on top all the time. They could go down, I suppose, but I guess they would't undertake it. You see there is only about 10 or 12 fathom, and from that down to 7 or 8, across there; I don't think they would undertake it.

Mr. BLODGETT. As I understand, you do not consider the canal efficient to-day?

Capt. CROWLEY. No; and I never thought it has ever been.

Mr. BLODGETT. For the coastwise trade?

Capt. CROWLEY. I have been down through the canal a good many times. I was down at the opening, and I saw the dangers of the canal at that day.

Mr. BLODGETT. Your belief is that the Government should take it and make it wider and deeper, for it to be used by the coastwise trade?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. What other trade could use it; trade coming from how far south?

Capt. CROWLEY. All trades coming from the south would use it.

Mr. BLODGETT. Would you include those from South America?

Capt. CROWLEY. No; not South America so much, because they generally strike in back of the Vineyard and come in the South Channel.

Mr. BLODGETT. But to avoid submarines, they could use it?

Capt. CROWLEY. Yes; they could strike in at Barnegat and follow that route.

Mr. BLODGETT. And they would come through there then?

Capt. CROWLEY. They would come in through there then.

Mr. BLODGETT. But in ordinary peace times, they would use the outside, Nantucket route?

Capt. CROWLEY. Yes. But that would be a small percentage.

Mr. BLODGETT. All the fruit steamers ordinarily run outside?

Capt. CROWLEY. Yes; they run outside.

Mr. BLODGETT. But they would save distance in going through the canal—the fruit steamers—if the canal was big enough for their boats?

Capt. CROWLEY. I don't think the fruit steamers would save much time.

Mr. BLODGETT. That is, they lay their course in such a way that it is about the same?

Capt. CROWLEY. Yes, sir.

Mr. BLODGETT. They do not go through the Slue at all?

Capt. CROWLEY. No; they come outside.

Mr. BLODGETT. Outside. But everything from South America would save by it?

Capt. CROWLEY. All light draft vessels, all small vessels from South America which most generally come in by the Vineyard, of course they would use the canal a great many times.

Mr. BLODGETT. That is all, Captain, unless there are some questions that the board want to ask you. Thank you very much.

STATEMENT OF LIEUT. COMMANDER THOMAS A. SCOTT, UNITED STATES NAVY.

Mr. BLODGETT. You are now commander?
Lieut. Commander SCOTT. Lieutenant commander.
Mr. BLODGETT. Your business before that was what?
Lieut. Commander SCOTT. Salvage.
Mr. BLODGETT. And where was your place?
Lieut. Commander SCOTT. New London and Boston.
Mr. BLODGETT. Thomas A. Scott & Co.?
Lieut. Commander SCOTT. Yes, sir.
Mr. BLODGETT. How long have you been in that business?
Lieut. Commander SCOTT. I think over 20 years.
Mr. BLODGETT. Were you familiar with the Cape Cod Canal?
Lieut. Commander SCOTT. To some extent.
Mr. BLODGETT. From its inception?
Lieut. Commander SCOTT. Yes, sir.
Mr. BLODGETT. Did you have work done on it at various times?
Lieut. Commander SCOTT. Yes, sir.
Mr. BLODGETT. In the building of the canal?
Lieut. Commander SCOTT. Yes, sir.
Mr. BLODGETT. And also in repairing it and in taking vessels out of it that were sunk?
Lieut. Commander SCOTT. Yes, sir.
Mr. BLODGETT. So that you have been pretty familiar with it from the beginning?
Lieut. Commander SCOTT. Yes, sir.
Mr. BLODGETT. You know of the question that is up here, with reference to whether the Government shall take the canal and make it efficient, and if that is done whether the coastwise vessels would use it and operate through it. What have you to say as to the advisability of the Government taking the canal and making it efficient and operating it?
Lieut. Commander SCOTT. Why, it seems to me that there are a great many questions that I am not qualified even to consider in that connection. In the first place, the cost of it in its present state of development, together with what it would cost to make it a thoroughly safe canal, compared to the increase in the efficiency of transportation. I do not think I am qualified to say as to just how that would figure out in dollars and cents.
Mr. BLODGETT. I do not suppose anyone is.
Lieut. Commander SCOTT. It would seem to me, however, that if the canal was made a thoroughly navigable piece of water——
Mr. BLODGETT (interposing). And kept so?
Lieut. Commander SCOTT. And that improvement was made in such a way as to increase the possibilities of commercial development in the vicinity of the canal, which I believe could be done, it then seems to me it would be a very feasible thing for the people to take the canal and develop it.
Mr. BLODGETT. In your opinion, has that canal ever been made efficient for the coastwise trade as a whole?
Lieut. Commander SCOTT. No, sir.
Col. ROESSLER. Will you state the reason why?
Lieut. Commander SCOTT. Well, the depth of water in the canal has not been sufficient to take the coastwise trade generally.
Col. ROESSLER. And the other element of danger?
Lieut. Commander SCOTT. For vessels of great length there has been a very great hazard in there, and then the uncompleted state of the canal, bowlders protruding from the banks on both sides, made it very dangerous to navigation.
Col. ROESSLER. Is lack of sufficient depth an element of danger?
Lieut. Commander SCOTT. Yes, sir. I think that has had a great deal to do with it.
Gen. ABBOT. How about the currents?
Lieut. Commander SCOTT. Well, the current in that width of canal is a very serious thing, and then with a current of that velocity a vessel has not very much chance if it gets caught, because there are only certain places where it could stop. My notion is that if we had apron wharf the whole length of the canal on one side, so that a vessel could stop anywhere, and that wharf could be used as a commercial development for the entire locality, it seems to me it would make the canal absolutely safe, regardless of the current, and I doubt if it would cost much more than to put a lock in to reduce the current.
Mr. BLODGETT. Suppose you would deepen the canal to 30 or 35 feet and widen it up to 200 feet at the bottom, would that make it much more efficient?
Lieut. Commander SCOTT. Yes, sir; I think it would.
Mr. BLODGETT. And would that be wide enough in your judgment for coastwise vessels to pass each other if they used care?

Lieut. Commander SCOTT. I think with the protection of the bank on one side, it would be absolutely safe.

Mr. BLODGETT. Like dolphins, you mean?

Lieut. Commander SCOTT. A dolphin is a very difficult thing to maintain there. They had dolphins in there for a very small proportion of the length of the canal and it kept a considerable gang of men all the time busy to maintain those. So that a more permanent structure I think than dolphins should be considered.

Mr. BLODGETT. And if the canal were made efficient and kept so by the Government, what do you think with reference to its use by the coastwise trade then?

Lieut. Commander SCOTT. I believe it would be used generally.

Mr. BLODGETT. What do you think about Pollock slough and its vicinity with reference to accidents from your past experience?

Lieut. Commander SCOTT. Of course we have had a great many accidents.

Mr. BLODGETT. That has been known as one of the worst place on the coast, has it not?

Lieut. Commander SCOTT. Yes.

Mr. BLODGETT. And why is that?

Lieut. Commander SCOTT. Because there is an abrupt turn there where vessels are apt to meet.

Mr. BLODGETT. Are there shifting sands out there?

Lieut. Commander SCOTT. Yes, sir.

Mr. BLODGETT. So that you never can tell what the bottom is?

Lieut. Commander SCOTT. Well, it changes somewhat from time to time.

Mr. BLODGETT. It changes every winter, does it not?

Lieut. Commander SCOTT. To some extent; yes sir.

Mr. BLODGETT. And would the canal keep vessels from meeting the submarine danger—using the canal, of course, from Norfolk?

Lieut. Commander SCOTT. I am in the service as a salvor. I have no military training whatsoever.

Col. NEWCOMER. Do you consider it necessary to have that apron wharf that you speak about or a lock, one or the other, even if you widened it?

Lieut. Commander SCOTT. Why, it seems to me that it is going to be very difficult to protect the banks without a very great expense; that is, you have got to riprap those banks in even if you do widen it, and if you are going to riprap the banks it seems to me some protection on one side right up to the channel line would make it possible for one vessel at least to hug absolutely or go right up close to that bank anyway, with perfect safety, which would give the vessel on the exposed bank side much more leeway than he would have if it was not for that. Of course, a man can not go absolutely up to the line in navigating when there are marks. He has got to keep away from there to some extent. Since you have got to riprap the banks anyway to make some means of protection, either dolphins or something else, at certain places, it seems to me by building a wharf the whole length of one side the benefit that you would get in navigation, added to the commercial development which would accrue from that, would seem to me by far the better way to develop the canal as a whole.

Gen. HAINS. There is riprap along the banks?

Lieut. Commander SCOTT. There is in places, but it is not thoroughly riprapped.

Gen. HAINS. Pretty nearly all of it.

Lieut. Commander SCOTT. No, sir; in fact, a small proportion of it.

Col. NEWCOMER. It is riprapped mainly where the banks have been cut. In other words, at the end, for instance, where the banks were naturally fast, they were not disturbed by the canal cutting?

Lieut. Commander SCOTT. That is true on top, but the banks of the canal ought to be riprapped all the way down.

Gen. HAINS. I did not mean that it has been riprapped all the way to the bottom of the canal.

Lieut. Commander SCOTT. That is where a lot of our difficulties have come, by the unearthing of these boulders.

Gen. HAINS. You do not consider the riprapping as it has been carried out, as effective?

Lieut. Commander SCOTT. No, sir.

Gen. HAINS. That is the point I wanted to get at.

Mr. BLODGETT. In other words, the difficulty that you have had from vessels that have been sunk and lost in the canal has come largely from boulders below low water?

Lieut. Commander SCOTT. Yes, sir. That is true.

Mr. BLODGETT. And there were a great many of those?

Lieut. Commander SCOTT. On the slope, and some that have rolled down out of the slope into the channel.

Mr. BLODGETT. And there are a great many of these now?

Lieut. Commander SCOTT. Yes.

Col. NEWCOMER. You mean there are a great many bowlders lying in the channel?

Lieut. Commander SCOTT. No, sir; but protruding from the banks of the canal. The banks are sand, and that sand moves from time to time, and any obstruction on the one side of the canal will shoot or make over on to the bank on the other side.

Col. NEWCOMER. Is there any evidence that there are any bowlders now in the 100 feet width?

Lieut. Commander SCOTT. I do not know, sir. I should say that there are some. That is, that depends on what depth you are talking about.

Col. NEWCOMER. I mean above the 25 feet?

Lieut. Commander SCOTT. I think there are. I think there are bowlders now protruding above that elevation in the channel bottom itself.

Col. NEWCOMER. What is the basis of that opinion?

Lieut. Commander SCOTT. Well, because we know that a great many of those bowlders were pretty nearly ready to tumble out.

Col. NEWCOMER. It is not because boats have touched them in the channel?

Lieut. Commander SCOTT. So far as I recall, I think such bowlders as have hit vessels have been removed. That practice has been followed, but I would not dare to say that there are none in there now. It has been some time since any work was done in there.

Mr. BLODGETT. From your experience, was it necessary to be doing work of that kind on account of the condition it was in when it was opened?

Lieut. Commander SCOTT. I do not know——

Mr. BLODGETT (interposing). I mean, was it in proper and efficient condition when it was opened?

Lieut. Commander SCOTT. No, sir; it was not.

Mr. BLODGETT. And the time you were there you were doing work——

Lieut. Commander SCOTT (interposing). Trying to complete the things that should have been done.

Mr. BLODGETT. That is all. I thank you very much for coming down here.

STATEMENT OF MR. WILLIAM S. M'NARY, MEMBER WATERWAYS AND PUBLIC LANDS COMMISSION OF MASSACHUSETTS, BOSTON, MASS.

Mr. MCNARY. I am a member of the waterway commission. I understand the chairman of the commission, Mr. Cole, the present chairman, has addressed you earlier this morning on this subject, and I think he has covered probably in some respects the commercial aspect, perhaps completely.

I have been associated on the commission for six years, during which time most of the work has been done on the Cape Cod Canal. It was started before I was on the Commission, but most of the work has been carried on under commissions on which I have served.

The State of Massachusetts, I may say, for many years looked favorably on the construction of a canal, and various bills have been introduced since about 1890, giving various companies charters to do the work. Some hundreds of thousands of dollars were spent by some companies and lost. None of them, though backed in some cases by men of wealth, were ever successful. Mr. Lockwood of Boston undertook to build a canal and built about a mile or a mile and a half. But none of the efforts to build a canal were ever successful. So the State of Massachusetts finally gave quite a liberal charter to Dewitt C. Flanagan and his associates and the canal was started, and Mr. Belmont and his associates took it over and carried it to completion. I think you gentlemen are acquainted with the depth of the canal at the present time. One of the requirements was that the canal should be 25 feet deep and it was made so and we gave a certificate of completion.

A troublesome question, of course, was the lock question. That was finally decided against, in spite of the fact that the tide on one end rose to 9 feet and sometimes 10 and even up to 13 or 14 feet in times of storm in the Cape Cod end of the canal and from 3 to 5 feet on the other end, and the difference in the tide caused many men to feel that there should be a lock, but we finally decided against it after long consideration and talking about the matter. We talked to people, to shipping people and to people who had operated boats in a narrow channel like the Chicago River and Hell Gate. We finally decided against it, and one of the material things was that if men could afford to take barges and so on in such narrow channels as the Chicago River and also in such a vicious and fast running channel as Hell Gate, we felt we could control it in this channel also. Of course, there have been some wrecks in the canal. You have heard the testimony of Mr. Scott, but the canal when completed was 25 feet deep. Some bowlders have rolled down and some of the riprap has gone in. For myself I have always thought that the riprapping was rather too small; that is to say, the stones were

too light. I always thought that way about it, but the engineers seemed to think it was sufficient. Heavier stones have been used when the banks began to shell. With heavier stones the tendency would have been to sink in rather than to go down. Some of the lighter stones have gone down, but they would not materially fill up the canal, but some bowlders have gone down, but taking it by and large, as our observation extended, the canal was opened up for traffic; that is to say, not formally completed, because the certificate of formal completion was almost two years later.

We have felt that it has been of great benefit to Massachusetts and New England. It has not fulfilled all of the expectations, to be sure. One reason, of course, is the ice in winter. This last winter, of course, was an exception. There was ice everywhere. I understand Hampton Roads was frozen over, in addition to other places. In the ordinary winter the ice is not particularly troublesome, but in a fair winter there is to be found an ice formation in the canal, and in Buzzards Bay, which is itself a landlocked bay. Some method, if the Government takes it over, ought to be considered to remove that difficulty.

At the present time I might say that the canal has not fulfilled the requirements of the traffic, even of the coastwise traffic. When the canal was projected and the charter given in 1899 and amended in 1900, there was scarcely a vessel on the coast in the coastwise trade that drew more than 14 or 15 feet. Eighteen feet would cover any of them. Practically all of the business was done at a less draft than 18 feet, and 25 feet was regarded as a very safe depth. The colliers of the Boston Consolidated Gas Co. draw 26 feet at the present time. Not one of them has ever been through the canal, and the tendency along the coast is for larger vessels. In the barge trade, even the barges are growing larger. The canal has proved to be a very fine and convenient and tremendously important development for commerce in cheapening the transportation, not merely in the question of rates and shortening of the distance, but in shortening of the time and the prevention of the liability to wreck.

If the Government takes over the canal, as in my judgment it should, because in my opinion the State of Massachusetts or the Government of the United States should have built the canal in the beginning—that has always been my opinion. I had the honor of serving in the legislature and in the senate, and I have voted for several canal propositions, and while in favor of having the canal built by private interests, it has always been my opinion that this was essentially a Government work and should have been conducted by the Government; either the State of Massachusetts should have done it, just as New York has built the Erie Canal, or that the Federal Government should have done that work. The Federal Government has adopted that policy, because, as you gentlemen are well aware, after the State of Michigan had built the Sault Ste. Marie Canal originally, the Government took it over and enlarged it and developed it and made it the extremely important artery of commerce that it is at the present time I shall expect, one of these days, to see the Government take over the Erie Canal, but while the State of New York has done an important service for the whole country, of course materially increasing the wealth and the importance of the commerce of the city of New York, yet, on the whole, to my mind the Government of the United States should own and operate all of these canals, and for that reason I am here to-day in favor of having the Government take over this canal, with the hope and expectation, if the Government does take over the canal, that the canal will be enlarged and deepened.

I am not a military or a naval man. I have served in the militia of Massachusetts, but the militia nowadays and for a number of years past has been regarded as really an unimportant body, and so that would not enable me to speak as a military man or as a strategist, but you gentlemen can solve that for yourselves. However, I have seen some very interesting articles on the value of the canal in a military and naval way, and those articles have convinced me at least, speaking as a layman, that it would be of considerable value. We all know the value of the Kiel Canal, and while this is not linking two great and important seas like the North Sea and the Baltic, nevertheless it seems to me that it can be made of great value in a naval way. From the commercial aspect we know in New England from the old colonial days that around the Nantucket Shoals and around Cape Cod itself has been one of the worst spots in the world for commercial disasters, and I have here a chart, if I may be allowed to bring it in, which will illustrate that in a very striking way to you gentlemen. [The chart referred to was here displayed.]

It also shows the wrecks about Point Judith and that section, but they are of comparatively small vessels. These are either all coastwise or high-sea craft. In other words, vessels which have been wrecked along this coast, all that great and tremendous number, some thousand and odd, are vessels capable of navigating the coast and to South America and some in the trans-Atlantic trade. That is a very impressive sight. All of those disasters would not have been avoided by a deepening and widening of

the Cape Cod Canal, but very many of them would. In addition to the property losses there has been a tremendous loss of life. With the deepening and widening of that canal, pretty nearly all the coastwise vessels would use the canal. The foreign vessels necessarily would not go out of their way and go up in that direction [indicating], but it would be a tremendous saving in property value and saving in life if that canal is taken over by the Government and developed to its proper extent. When I say to its proper extent, as a commissioner of Massachusetts, if we could see the money in sight and get it, I would favor the State taking it over. But Massachusetts has many problems and many debts and a tremendous expenditure of money, and we can not afford to do it. Otherwise I should favor her taking it over and building the canal larger and deeper.

As to the commercial advantages, statistics will be presented to you gentlemen here. In view of the railroad situation, Boston, and in fact all of Massachusetts, has had to suffer in competition in the past, and they are very much interested in this matter. We think a larger and a deeper canal and a better canal would have an effect upon our freight rates and shipments to the South and other portions of the country, and from that standpoint we are interested in it, and that benefit would touch not merely the manufacturers of New England, but would touch all the consumers of goods throughout the whole country, because any diminution in freight rates and any stated tendency in that direction is exhibited throughout the trade. The manufacturer does not get the whole of it by any means.

The State of Massachusetts is putting up money of its own. The chairman has told you of the development at New Bedford, which is now serving an extremely important purpose. We are very greatly interested in this matter, and I think I speak the sentiment certainly of official Massachusetts, and I think also I may speak for commercial Massachusetts, because I am in business myself, in favor of the Government taking over this canal and operating it.

I am a great believer in canals. I have studied a great many of them.

Mr. BLODGETT. I would like to offer this chart. It is compiled in the United States Engineers' office at Newport, R. I. I would like to offer it and leave it with you gentlemen.

Col. NEWCOMER. I notice on the map that that is only a partial record.

Mr. MCNARY. It is not up to date.

Col. NEWCOMER. They do not have the wrecks on the canal.

Mr. MCNARY. No. There are only a few of those, when it is all said and done. This map was made before the canal was built even. The Boston Globe a few years ago I think brought the number of wrecks up to date and had the whole of them, and I will see if we can work it all out.

Personally, I favor the project of canals along the coast. I believe that if that were done, I am strongly in favor of having that project carried out, and I think in the course of time the United States Government will carry it out.

It is not for me particularly to go to foreign countries, but I have noticed in the past year and in the past two years that, in spite of the tremendous expenditure of money, that the German and Austrian Governments have necessarily been compelled to provide for in the war, they have steadily carried on the development of the canal system of those countries, and one of the great means by which the Germans have arrived at the low cost of manufacture is the development of the canal system.

A number of years ago when I was a Member of Congress a party of us had occasion to visit that country and had the opportunity to see these canals, and I may say of the gentleman who is now referred to as the beast of Berlin, we had a very interesting talk with him in regard to the development of the railroad and canal systems of that country. He asked our opinion as to the railroad system, and we thought it was pretty bad. Then he pointed out to us the development of the canal system, by which the manufacturing materials are transported from one point to another. Now they are carrying that system down into Austria and have connected up the Elbe and the Danube.

They are connecting up the headwaters of the Oder with the Vistula. Also this system has been carried out to a great extent in France, but not to such an extent as it has in Germany, and I have noticed in various reports that in France they are shipping quite a lot of their war materials through the canal. England, which had a fairly good canal system before the war, is beginning to increase it and add to it, and have lately turned their attention to the canal system and are going back to the redevelopment of their canal system, because they have seen the benefit which it has been to Germany, in order to carry heavy material. Speaking for myself, I think this Government ought to have an endless passageway down the coast of New Jersey and Delaware and on down the coast, so that we can transport the great raw materials of the products produced in the South to New England and to New York.

Nobody can gainsay the fact that the building of the Erie Canal was the thing that made New York the great commercial city of this country, because it centralized the products of that great agricultural and mineral section of the country and the Middle West down into the port of New York, and while we admire New York, we rejoice at its good fortune, it seems to me that the lessons which have been taught by the building of these canals ought to be applied to other sections of this country.

There has been some discussion as to the cost of this canal. I think some time ago we were called on for figures. The State of Massachusetts adopted in this bill this idea and this principle. Every bill which had been passed and every charter granted ended up in disaster by reason of lack of money to complete the canal, and the State of Massachusetts, after consideration of the matter for many years, because canal bills passed from 1885, certainly from 1889, as I remember, up to 1899, had given the canal company no authority to raise money, and at one time a Canadian, I think Edwin Smith—I think that is his name—came down to Massachusetts and got a charter, and the provisions were so narrow and the opportunity absolutely denied them to raise money either in Canada or this country, so that charter was given on the basis that if a canal was built with the requirements of having a waterway from Cape Cod Bay through that stretch of land 8 miles to Buzzards Bay, with a sufficient approach channel and the proper width, 100 feet wide and 25 feet deep, the State of Massachusetts would estimate that work and allow it to be estimated as $12,000,000, the taking of lands and the securing of rights, the cost of raising money or issuing of bonds and stock, and things of that kind, the premiums that had to be paid, the interest, and the like, and therefore laid down the proposition that if the people would accept that charter they would take $12,000,000.

The question was asked me how were we to allow the issue of bonds or stocks as against so much work. We allowed it on the basis of the work performed. The proportion was given us, but that proportion was not kept exactly until the end, and then in the cleaning-up process, where everything was brought down and completed, the total issue was allowed. We allowed for the changing of the railroad tracks, the building of new roads, the taking of lands and the destruction of oyster beds, and the cost of raising money.

The State of Massachusetts or the Government of the United States can go into a matter and it does not cost—it might cost as much to build, but it does not cost them as much to raise money as private individuals, and private individuals having raised the money are entitled to some profit. That is the reason I conceived it, and I was in the legislature in 1900 and I happened to vote on this matter, and that was the reason that it was put in and we passed the bill in that spirit.

Col. ROESSLER. On that point I would like to ask a question. The canal was completed in accordance with the charter?

Mr. MCNARY. Yes, sir.

Col. ROESSLER. Has it been maintained in accordance with the terms of the charter?

Mr. MCNARY. We have no authority on that matter at all. When the canal was completed, and of course we kept them right up to the limit of the line on that, so much so that they complained at times very bitterly about the action of the commission; they did not regard us as very friendly to them: but, as regards the maintenance of the canal at the present time, that is up to these people. They ought to be able to make some money out of it.

Col. ROESSLER. Then there is no requirement in the charter to maintain the canal?

Mr. MCNARY. No, sir. It is a proposition which these gentlemen have it upon themselves to keep that canal in such a condition as to make something out of it. I do not think that there is anything in the charter that could require them to keep it open. I do not think so. That is another reason why the Government should take over the canal, and that is a very good reason indeed. It may be said that the Government can not make money out of it. The Government was not instituted for the purpose of making money, neither the State of Massachusetts nor the United States. The Government was instituted for the purpose of trying to develop this country and make it the greatest good to the greatest number, and to do business in, and so on, and I conceive that in a project of that kind, where it can be shown to be a benefit to the whole country by the cheapening of the freight rates, by offering a security for property and the saving of lives, that it is a perfectly proper business for the Government to take hold of, and in fact it is its duty.

Col. ROESSLER. You spoke of $12,000,000 has been the estimate of the value of the canal. Do you not think that works against their claim for compensation to that amount?

Mr. MCNARY. No; I do not. Like any other business proposition, if I was running the business or running anything else, I would endeavor to keep it up. If I was not making money, I should keep it properly.

Col. ROESSLER. That would destroy the value of the proposition?

Mr. McNARY. It might. On the other hand, I might be able to make a living and get along. Otherwise I might lose everything. The best thing to do is to keep it absolutely up. But if you fall down and can not make money, what are you going to do? It is easy enough for a man to say, "Do this" and "Do that." There are several requirements by which we have compelled some similar public agencies to do these very things, and sometimes to the detriment of the agencies. The Government at the present time in taking over the railroads advances freight rates in a wholesale fashion, pointing out that this is in order to have these railroads to meet their needs and to get money for the issue of new bonds, and yet for a number of years past these railroads have been asking the Interstate Commerce Commission again and again to advance rates and the business people have opposed that. Many times they have felt that the railroad people could have saved money by certain economies. I am not saying that the railroad people are running their business in a first-class fashion, but the fact remains that almost every lot of shipping organizations in the country have opposed, and I personally would be inclined to oppose, the increase of rates. We know that increases in the rates have got to be added to the price we sell to the consumer, but when the country raises the rates there has not been a murmur.

As regards this thing at the present time, if the company can not keep it up and can not make money and are going to lose the expenditure of large sums of money to keep it right up to its full requirements, as laid down in the charter, the tendency naturally in the hands of private business is to let it go down a little bit and let the people save some money.

Col. ROESSLER. One reason I asked that question was that it is a matter of record here that the officers of the company had not asked for the sale of this property to the United States; that they believed that it was a real good investment, and I just wanted to get your viewpoint.

Mr. McNARY. The Public Service Commission of Massachusetts, which was the old railroad commission, has a certain amount of jurisdiction now. We have no authority over the rates. We felt, again, that that provision in the charter would have deterred investors from going into this matter, and it was hard to raise money. No, I do not know whether it wants to sell or does not want to sell. I do not know whether or not they feel that any growth of business in the future would justify them in continuing the canal or not. Perhaps the exigencies of the war and the inability to get money may have caused them perhaps to let down on that job a little bit. I do not know whether they want to sell or do not want to sell exactly, but for my part, speaking as a man in public life and as a public official of the State of Massachusetts, I believe the public ought to have it in the first place.

Secondly, from a man who is in business, and while we have not shipped any goods that I know of through the canal, nevertheless I know many shippers and many people who get shipments of cotton and southern lumber and other products of the South and are shippers of manufactured goods, in my judgment that traffic can be taken from the railroads and sent down through the canal and I know that a lot of our boots and shoes take this route and go down to Savannah and then to Memphis and St. Louis and Kansas City.

In the interests of all the manufacturers and consumers of raw materials in New England, I think it ought to be taken over, and I would naturally expect that the Government should improve it. If necessary to keep that channel open in the wintertime when the hard storms are here, to keep it open. I do not concede that the Government of the United States ought to consider the question of whether they are making a dollar or not. But the private individual has always got to consider that matter. I thank you.

Gen. HAINS. We will adjourn over now until half past 1.

(Whereupon, at 12.55 o'clock p. m., a recess was taken until 1.30 o'clock p. m., same day.)

(After recess.)

The hearing was resumed at 1.30 o'clock p. m., at the expiration of the recess.

STATEMENT OF WILLIAM C. BREWER, CHAIRMAN OF THE COMMITTEE ON MARITIME AFFAIRS OF THE BOSTON CHAMBER OF COMMERCE, BOSTON, MASS.

Mr. BREWER. I happen to be chairman of the committee on maritime affairs of the Boston Chamber of Commerce, and somehow or other it was heard up there in Boston that there was perhaps a feeling here that there had not been an interest in the case of the canal on the part of the commercial bodies there, so I said I would be willing to come down and speak to the contrary if they wanted me to and they said they would be very glad to have me come, and I said, "Won't you write me a letter that I can send along ahead of me as a credential?" and it seems that this letter was written

and it was mailed not directly to you through the mistake of a clerk, but I secured a copy of it. I do not know whether you have received it or not received it, but if you have not you will receive it. It is addressed to the Board of Army Engineers, Washington, D. C. It is dated July 22, and if I may read it I would like to, because it outlines the attitude of our chamber of commerce with regard to this project:

"Mr. William C. Brewer, chairman of our committee on maritime affairs, has been authorized to represent the Boston Chamber of Commerce at the hearing to be given by your board at Washington, on Tuesday, July 23, 1918, and will present our views on the advisability of the Federal Government taking over, by purchase or otherwise, the Cape Cod Canal.

"The Boston Chamber of Commerce favors the purchase of the canal by the Federal Government if it can be secured at a reasonable and satisfactory price and, if it can not be secured at a price which seems to the Federal authorities reasonable and satisfactory, that it be taken by right of eminent domain and that the question of the amount to be paid should be determined by the Federal courts.

"The canal in its present condition can not be used by the larger type of vessels and is considered unsafe for boats with a draft in excess of 20 feet. The shipping now using the canal consists chiefly of moderate-sized steamers, tows and barges, two and three masted schooners, yachts, and other similar craft. Many other vessels would undoubtedly use the canal if its width and depth were increased.

"We are of the opinion that the acquisition of this canal by the United States, which would undoubtedly put it in proper condition and management for all shipping, is of the greatest possible commercial advantage to New England and to the rapid movement of large quantities of merchandise by water. In the wintertime, by using the canal, vessels would be saved the exposure to severe storms that frequently sweep the coast and endanger lives and shipping property. Government ownership would not only be an advantage to New England but to the entire Atlantic seaboard as a considerable part of our shipping is engaged in the trade between northern and southern ports.

"Besides its commercial value, it is generally recognized that the canal should be of considerable strategic importance from a military standpoint and expenditures of money by the Nation to enlarge and develop it at this time would undoubtedly be considered justfiable."

That is signed by the secretary. Also we communicated with several of our other commercial bodies there to see where they stood on this project, and I will leave with you not only the copy of this letter, but I will also leave with you a telegram which came from the Haverhill Chamber of Commerce. This telegram is addressed to me, and it says:

"Haverhill Chamber of Commerce very much in favor of purchasing Cape Cod Canal at a reasonable figure.

"N. H. STACKPOLE,
"*Acting Secretary.*"

Here is another one, likewise addressed, from the Board of Trade of Gloucester, signed by Fred L. Davis, president, and Wilmot A. Reed, secretary:

"Board of trade heartily approves of Federal ownership of Cape Cod Canal provided price to be paid is an equitable one, and profiteering eliminated. Believe Government should widen and deepen which would make canal of immeasurable value to New England. Kindly express these views to Army board."

Here is another telegram from the Portland Chamber of Commerce, signed W. B. Moore, executive secretary:

"You are hereby authorized to represent this organization at hearing Tuesday in Washington on advisability Federal Government taking over by purchase or otherwise Cape Cod Canal stop; we favor acquisition of this canal by Government provided owners are willing to sell at reasonable figures or that canal be taken by right of eminent domain and question of amount of payment determined by Federal courts stop on our behalf urge governmental action at once."

The president of the Salem Board of Trade telephoned me on the afternoon of yesterday asking if I would also speak for them in just the same way.

That gives you just a little idea of some of the more important commercial organizations and how they feel about this project.

Our chamber has been interested in this canal in a way since its beginning. We fathered it all along. Years gone by, years before it was started, others had some idea of completing a canal through there at that place or other places, somewhere across the cape, and we had these projects laid before us from time to time, but always in New England there has been considerable skepticism about the possibility of a canal across the cape and so when this one was completed, so far as it has been completed, we were naturally very much interested and thus it seemed like a grand success, but

you know what has happened to it and how inadequate it is filling the demands of shipping at the present time.

If it is reasonable to take over the canal in this way and have it put into proper condition and kept in proper condition, there does not seem to be any question with us but what almost all of the shipping that otherwise goes around the cape would pass through that canal.

A year ago we had a little talk with two of our coast pilots. You know there are pilots licensed to carry vessels around the coast as well as our harbor pilots, around to New York, for instance; a good many ships from Calcutta, India, and from Chinese ports—in peace times also from Europe—from South America, I regret to say some of them German ships, were more and more bringing cargoes to be discharged partly at Boston and partly at New York, and more and more they seemed to be getting into the habit of coming to Boston first, because they got their outward cargoes at New York. Those ships were taken around to New York, and I said to these pilots in effect, "Why don't you go through the canal?" They said, "There is not water enough there and we do not think there is going to be," and I said, "Would you use it for such ships?"—they were large ships, some of them German ships of 10,000 or 12,000 tons. They said, "Certainly, we would. We prefer to go that way."

That was testimony from the coast pilots, accustomed to handle these big ships. If you gentlemen would only take a 25-foot yawl or a sloop, as I have done, and select either from Boston or from Provincetown or from the other side the best day you could possibly pick out for going around Cape Cod in that small boat comfortably, I am sure, I will guarantee, that before the day is out you would wish that you had not tried that in that small boat. That is a good illustration of the difficulties around Cape Cod. You rarely get the same conditions all the way around that cape. Even in the summertime you get for the small boat rought weather in one place, where you are starting out with smooth weather at the other end.

It is a question to-day very largely of more and more use of small boats. Perhaps somebody has called your attention to the fact that New England is cut off there at the present time. But there is not any doubt that wheat and other things that were expected to be shipped over the Erie Canal in 1,000-ton barges would in the summertime come right around this way through the canal to Boston.

Col. NEWCOMER. Of course they could do that under private management?

Mr. BREWER. They could do that under private management, but we have not any faith in private management. We have never had any faith in it.

Col. ROESSLER. Why would these barges of grain want to go to Boston through New York?

Mr. BREWER. Not so much for export. I had in mind coal, not so much as grain.

Col. ROESSLER. You just spoke about there being a tendency to increase the number of smaller craft. I thought the tendency was the other way, to construct more and more larger ships for the carrying of the bulk traffic?

Mr. BREWER. Yes, for coal it is the tendency, before the war broke out, for larger colliers of 10,000 tons. Personally, I doubt whether these very large colliers, deep laden, would ever use the canal. They might going light on their return, but I doubt whether they would go deep laden. But an inland waterway, for it is more essentially hat, although I believe, strictly speaking, shoals are inland waterways?

Mr. BLODGETT. Not around the cape.

Mr. BREWER. Over the shoals is?

Mr. BLODGETT. Over the shoals is.

Mr. BREWER. That is the worst part of the cape, and the enlargement and use of our inland waterway would naturally be more for the small craft, make movement easier.

Col. ROESSLER. Don't you think that an enterprise like this would be perfectly successful, like the Suez, provided it was a paying enterprise?

Mr. BREWER. Yes, but I do not like to express any opinion or seem to express any opinion on what has taken place. I do not know who it was built or for what purpose. I mean, what the builders had in mind. It certainly can not have been a paying proposition so far. They have not built it in a way to induce sufficient trade to go through it to pay. It would be possible, I should judge, taking the amount of tonnage, the number of ships, that are passing all the time around Cape Cod, to construct a canal that would be a reasonable proposition commercially, but they have not done it.

Gen. HAINS. You read a number of telegrams, and every one of them speaks of a good proposition for the United States to take possession of the canal if they could get it at a reasonable price?

Mr. BREWER. Yes, sir.

Gen. HAINS. Have you any idea what the reasonable price is that they referred to?

Mr. BREWER. They say "Provided price to be paid is an equitable one," and "Provided owners are willing to sell at reasonable figures or that canal be taken by

right of eminent domain and question of amount of payment be determined by Federal courts." That is a typical one. No, sir, I have not, but I assume by a process of auditing, it can be found out about that.

Col. ROESSLER. All those telegrams affect the fear that the canal under private ownership will never be a success?

Mr. BREWER. Yes, sir; I think we all fear that.

Col. ROESSLER. That is what I mean.

Mr. BREWER. That is what we mean. I have not any idea what the private owners will do if the Government does not take it.

Col. NEWCOMER. Don't you think that one of the principal motives back of these efforts to have the Government ownership is to get rid of the tolls?

Mr. BREWER. Very likely.

Col. NEWCOMER. In other words, to get a certain public contribution to the cost of transportation for this New England service?

Mr. BREWER. Very likely. They expect, I presume, that they will be free.

Col. NEWCOMER. They advocate the reduction of freight rates on New England freights?

Mr. BREWER. Yes.

Gen. ABBOT. If the Government would remit the present toll rates?

Mr. BREWER. I do not know what the present toll rates are. Freight rates to-day are enormous. They could afford to pay any tolls to-day, but when you take a $2.50 per ton coal rate to-day you can afford to pay almost any reasonable canal toll if it is privately owned, but when after the war perhaps there is a return to what they were before, 55 or 60 cents a ton, it is impossible to pay any toll under those conditions. It might be on barges. If you could have a certain number of day's use of the barge, especially in foggy weather by going through the canal, there might be something in it.

Col. NEWCOMER. That is the whole theory of it, that they do save, that they have a shorter trip and a greater turnover?

Mr. BREWER. That may be so, but the canal has not been constructed so that there is rapidity of movement through it. Vessels have been held up in it, and at its entrances, and it has been held up so as to allow other vessels to pass through it. So that there has not been a saving of time especially.

Mr. BLODGETT. In other words, the canal has never been efficient?

Mr. BREWER. It has not been efficient, no.

Mr. BLODGETT. I mean, even if the depth of 25 feet were maintained, it has not been efficient?

Mr. BREWER. Oh, no, not for 25-foot vessels.

Mr. BLODGETT. Mr. Brewer, you are in the marine insurance business?

Mr. BREWER. Yes, I am.

Mr. BLODGETT. As bearing on the question of insurance, if this were an efficient Government owned and operated waterway, would it have any effect on the rates over the rates around Cape Cod?

Mr. BREWER. Yes. If it were in an efficient condition.

Mr. BLODGETT. That is what I mean.

Mr. BREWER. If the vessels used it, there would certainly be a modification of the insurance premiums.

Mr. BLODGETT. It would lower the premium?

Mr. BREWER. Another feature of that would be that the smaller vessels would be permitted to pass through under their insurance policies. In fact, that is done now on yachts. Yachts confined to Provincetown and Eastport, in the policy of insurance, are now extended to include Long Island Sound, if passing through the canal.

Col. NEWCOMER. What is the present status about insurance on coal traffic around the cape or through the canal as to discrimination? Is there a discrimination either way, in favor of one route or another?

Mr. BREWER. No, because there have been so many accidents in the canal.

Col. NEWCOMER. Have there been many coal cargoes wrecked in the canal?

Mr. BREWER. Yes, quite a number. Those statistics must be available.

Mr. BLODGETT. There have been at least 8 or 10?

Mr. BREWER. There have been a number.

Col. NEWCOMER. I did not understand there were many. Do I understand that the insurance rates are higher through the canal than around outside?

Mr. BREWER. No. It is simply that there has been no reduction made.

Col. NEWCOMER. Going through that route?

Mr. BREWER. Yes, sir.

Col. NEWCOMER. I understood a while ago that it was stated—not at this hearing—that there had been a discrimination against the canal on the part of the insurance companies.

Mr. BREWER. I have heard that statement made, but in my experience I have not yet discovered it anywhere. Of course, every insurance company is a law unto itself, and the underwriter can make rates as he pleases, so that there might be an instance of that sort and I have not heard of it, but the great majority of companies have made no difference. The request has been made that if vessels use the canal a lower rate be given them, and I have heard the answer stated that it is experimental at present; to wait until it works out.

Col. NEWCOMER. Have you known of any refusals to insure for traffic through the canal?

Mr. BREWER. I have not personally, no, sir. There may have been instances when the canal was blocked.

Mr. BLODGETT. Have you not known cases of deep-draft vessels and large vessels that the underwriters would decline to permit to go through the canal?

Col. NEWCOMER. That is what I mean. In other words, where it was physically possible for them to go through, and yet the underwriters refused to underwrite them for that passage?

Mr. BREWER. Yes; they considered it not safe.

Col. NEWCOMER. Do you know beyond what limit of draft or size or whatever discriminating feature they use to determine that point?

Mr. BREWER. No, I do not. It was reported by the canal people at one time, a general report, that they had 25 feet of water there, and I think the public was assuming for the moment that there was 25 feet of water in that canal, but experience and practice proved that there was not, and I have heard masters saying that no vessels drawing over 14 feet could go through that canal at the present time safely. I do not know how that question can be settled. I would say that what has always been told us was that that is because of bowlders rolling down into the canal and then accumulating sand or silt around it.

Mr. BLODGETT. Of course, Mr. Brewer, you do not attempt to urge any particular price, or anything of that kind?

Mr. BREWER. Oh, no. I should not feel competent to do so.

Mr. BLODGETT. It is simply because you feel, and the interests you represent feel, that the Government ought to own that canal and keep it in proper condition and operate it?

Mr. BREWER. We do.

Mr. BLODGETT. And it is for them to determine with the owners or by condemnation proceeding what price they shall pay for it?

Mr. BREWER. Yes, sir.

Mr. BLODGETT. Can you give us any information on what use that canal would be in the case of submarine menace? Are you familiar with that feature at all?

Mr. BREWER. The best illustration is what happened Sunday. If the canal had been in use at that time, and that tugboat and barges had been passing through the canal, it would not have been destroyed by the submarine. I should say that was a good answer right at hand, and I presume all the smaller Government boats would invariably use it if it were in existence.

Mr. BLODGETT. If there are no questions, I thank you very much.

STATEMENT OF MR. JOHN W. DALTON, SANDWICH, MASS.

Mr. BLODGETT. Your full name is John W. Dalton?

Mr. DALTON. Yes, sir.

Mr. BLODGETT. What is your business?

Mr. DALTON. Fishing business.

Mr. BLODGETT. Where?

Mr. DALTON. Sandwich, Cape Cod.

Mr. BLODGETT. How long have you been in business down there?

Mr. DALTON. I have been in the fishing business 10 years.

Mr. BLODGETT. On Cape Cod?

Mr. DALTON. Yes, sir. I have lived there all the days of my life.

Mr. BLODGETT. You have been fishing on the canal or near the canal and using the canal since it was opened?

Mr. DALTON. Yes, sir, and before.

Mr. BLODGETT. Are you interested in a freezer?

Mr. DALTON. I am not directly interested in a freezer at the present time, although I was instrumental in having it built there and operated.

Mr. BLODGETT. Can you tell me from the fishing standpoint what is the availability of that canal?

Mr. DALTON. The Cape Cod Canal has been of untold advantage to the fishermen of my town and all the towns on Cape Cod, Nantucket, Martha's Vineyard, New Bedford and as far north as Gloucester. The town is over 275 years old. It is the oldest town on Cape Cod, and not until the fall of 1916 had there ever been a barrel of flounders caught in Cape Cod Bay and shipped from the town of Sandwich. In the month of November, 1916, a fisherman from Provincetown, on his way to Nantucket, put over his dredge in Cape Cod Bay about 2 miles from the end of the breakwater, just to try it out, and caught 5 barrels of flounders. I was then in charge of the freezer at Sandwich.

The freezer had not been completed at that time but is to-day, and he stopped at our wharf and wanted to know if we could pack them and ship them, and I had that work done for him. That was the first instance of any flounders being caught in Cape Cod Bay and shipped from there. He felt that the prospects of fish in Cape Cod Bay were so good that he would stay there and try it out, and he remained all winter. In a week or 10 days other boats learned that there was a flounder dragger in Cape Cod Bay shipping through the canal, and within a week or 10 days there were 30 flounder draggers, small boats from 25 to 60 feet in length, with 30 to 60 horse-power engines, engaged in dragging for flounders in Cape Cod Bay. They got there sometime early in December. They fished through December, January and well up into February, when the weather became extremely rough and they had to quit, and within that time they caught and shipped approximately 2,500 barrels of flounders. When they arrived there, the canal company collectors went aboard and demanded a toll of $1 apiece to anchor in the canal.

Gen. HAINS. A dollar a ton, you mean?

Mr. DALTON. No, sir, $1 a boat, regardless of tonnage. There was considerable objection. They said they thought fishing vessels anyway should be allowed to run in there and tie up over night without paying for it, but that was the charge that the canal company had fixed. A great many of them said, "We will stick it out through the winter now, but we will not come back any more," and a great many of them did not, but some of them came back in the fall, and beginning in October, which is about the regular time of year that flounder draggers begin their work, they ran through that month into November, December, January, and February, and they caught approximately 7,000 barrels of flounders and shipped them through the canal.

Mr. BLODGETT. Where did they ship them to?

Mr. DALTON. Principally to New York. They all expressed themselves as being pleased with the fishing grounds at that time. They said they were the best that they had found anywhere along the coast, but they did not like to pay anything for tying up over night, and they said "the canal company is charging us a dollar for tying up over night and every big vessel that comes along we have to stand by our mooring lines," and some of them not exactly sunk, but filled with water from the swash of these big vessels. They had booms broken and guard rails broken and some of them lost their gear off the docks, and they were in favor of having the Government or somebody take that canal and make it free for fishermen.

Gen. HAINS. Don't 50 or 60 of those vessels almost block the entrance to the canal?

Mr. DALTON. They string them along from the east end of the canal half way up to Sagamore, I should think, more than a mile, running on the west, or south bank of the canal, as we call it.

Gen. HAINS. Can't they go into Sandwich Harbor?

Mr. DALTON. No, sir. They can get in there on a good tide, but they can not always pick out the time to go in there, on account of the stress of weather. Their fishing is done in the wintertime.

Gen. HAINS. What depth do you have in Sandwich Harbor?

Mr. DALTON. They have what they estimate it is possible to get in on about a half tide, but it is a poor approach and a very bad place and none of the flounder draggers would undertake to go there except in the best kind of weather.

Mr. BLODGETT. How much do these boats draw?

Mr. DALTON. I suppose the average draft would be about 3½ feet.

Mr. BLODGETT. What is the capacity of the freezer there in the canal?

Mr. DALTON. 8,000 barrels.

Col. NEWCOMER. For what time?

Mr. DALTON. That is the full capacity. They can put 8,000 barrels of fish there at one time. They can hold that for three months and clean them out. That is what many freezers are doing at Provincetown. They will fill up with whiting, and then that will be cleaned out and they will fill up with herring.

Col. NEWCOMER. Where do they ship?

Mr. DALTON. The principal point is New York.

Col. NEWCOMER. By boat or train?

Mr. DALTON. By train.

Col. NEWCOMER. Can they be shipped by boat?

Mr. DALTON. I do not know whether any cheaper or not, but what the fishermen at Cape Cod and what dealers in New York would like would be to get the fish to New York the day after it is caught. Under existing conditions a fisherman goes out and fishes and he catches his fish and takes them in about 9 o'clock in the morning and then packs them in ice. He holds them until about 4 o'clock in the afternoon and then reices them and puts them on a 5 or 6 o'clock freight train of Monday night, when they leave Provincetown.

Other shipments are picked up at different points along the cape as far as Sandwich. They go to Boston, getting there Tuesday morning about six o'clock. Then they are taken from Boston sometime during the day to Fall River—that is Tuesday, sometime Tuesday afternoon—and they are put on the Fall River steamer and they get into New York about 6 o'clock, when the boat arrives. When those fish get to New York the fish are so far from the top of the barrel, the fish have settled down a foot under the top of the barrel, and unless a man knew that he happened to pack that particular barrel of fish, he would take an oath that they did not belong to him. He gets a small price and he says the dealer in New York is robbing him.

Col. ROESSLER. What is the value of a barrel of flounders at Provincetown?

Mr. DALTON. That depends, of course, largely on the time of the year.

Col. ROESSLER. You spoke about them catching 7,000 barrels last year?

Mr. DALTON. They sold last year at one time $36 a barrel of 200 pounds.

Col. ROESSLER. What is the average price?

Mr. DALTON. About $10 a barrel. But they would like a basin or a harbor at the eastern end to accommodate all kinds of fishing vessels. We had the other day to go through the canal a great big fishing vessel from Boston. They had caught 50,000 pounds of mackerel off Woods Hole and at the Vineyard. They sold their product to the Fish & Appraisal Co., took on a cargo of ice and went right back to the fishing grounds. They were on the fishing grounds relatively at the same time that they would have been in Boston. That is the advantage that they have at Sandwich. These boats fish on the coast; they fish off of Sandwich about 4 miles. They live in Provincetown, many of these fellows, and it is 25 miles to Provincetown. If the weather looks bad, they run back again, 4 miles back to the breakwater, and they can always get in that canal, but they do not like to pay that toll. Fishermen would go to Plymouth and spend $4 worth of gasoline, rather than pay that $1 toll.

There is no place along that coast that they have to pay to land fish. People are always glad to have them, there, and with Cape Cod Bay filled with flounders and clams and quahogs and scollops—they discovered a big bed of scollops in Cape Cod Bay last year, and there have been four beds obtained early this spring by local men who are going into the quahog, clam and scollop business this year—and I think it will be the means of creating a big industry there. I say, if the harbor were free, that that point would be the shipping place for all that part of the coast. I believe it would be ahead of Boston.

Mr. BLODGETT. They would ship over to New York from there?

Mr. DALTON. Yes sir; which is the chief distributing point.

Mr. BLODGETT. Do the Gloucester fishermen use the canal?

Mr. DALTON. Yes sir; that was a Gloucester vessel that I had reference to—the largest fishing vessel.

Mr. BLODGETT. As I understand you, the only difference to the fishermen between Government ownership and private ownership is that under private ownership they have to pay for their privileges, and under Government ownership they would hope to get them free?

Mr. DALTON. They would hope to get them free.

Mr. BLODGETT. Is there any doubt with reference to whether or not the private owners keep it up?

Mr. DALTON. So far as that goes, there would have to be pretty shallow water in the canal to bother those fishermen. They only draw light draft, and the canal would have to be at a pretty low level not to permit them to go through.

Col. NEWCOMER. Do they consider the toll for passage through the canal as unreasonable?

Mr. DALTON. Yes. They figure that that is quite unreasonable, although I understand that it has been somewhat reduced. I am not familiar with that, but a great many of these fishermen are Portuguese fishermen.

Col. NEWCOMER. Even if the Government owned the canal, it would not own the wharfage facilities.

Mr. DALTON. We never charge a man who comes to our wharf, but the canal officials come along and collect a toll of $1, whether a man has a 20-foot boat or a 75-foot boat.

Col. NEWCOMER. They anchor, don't they?

Mr. DALTON. They tie up at the wharf for nearly a mile along the canal.

Col. NEWCOMER. They used to anchor, didn't they?

Mr. DALTON. No, sir, not to my knowledge. I have been there since the canal was opened. They can not anchor there. They tie up at the dolphins, and when the New York boats come through, every man has to stand up and see that everything is all right.

Mr. BLODGETT. You have told us about the fishing business. Were you down on the cape Sunday?

Mr. DALTON. Yes, sir.

Mr. BLODGETT. When the submarine was at work?

Mr. DALTON. I was not there when she was firing, but I was there a few moments after she ceased firing.

Mr. BLODGETT. Tell us in short where that was?

Mr. DALTON. It was about half way between the Nausett Life-Saving Station and the Orleans Life-Saving Station, a little south of Nausett Inlet, and I talked to the captain of the life-saving station at Nausett, Capt. Walker, and he said that his first knowledge of any trouble off the coast was when some Italian fishermen came running up the beach and said a submarine had fired at them, and they were in a little two-masted steamer.

They were out there setting trawls for codfish when this submarine came up out of the haze and instantly, without any warning, fired four shots at that little boat, and they immediately abandoned ship, took to their dory, and ran to the beach. They ran up and told Capt. Walker that they had been fired upon by a German submarine, and he immediately notified the naval aviation station at Chatham by telephone, and the officer rowed out to a schooner that he saw standing by, about 2 miles, and notified him that there was a submarine. He said that he heard firing, but that he did not pay any attention to it on account of the target practice going on. He did not see the submarine where she was going. This submarine immediately overtook these barges.

Mr. BLODGETT. This was the regular ship channel?

Mr. DALTON. That is the regular channel. They were making the light and going to pick up the buoy at Orleans, and then right in the main ship channel, and I could see the tug and the stern of one barge very plainly from the shore. I heard the firing very plainly at Sandwich, I guess 25 miles away. I did not know what it was, and I was called immediately by telephone and took an automobile and raced over there but she was gone. I could see the stern of the barge afloat quite close to it, and this fishing vessel which was fired upon first was one of the vessels which frequently was engaged in fishing in Cape Cod Bay.

Mr. BLODGETT. Were the aviators there when you were there?

Mr. DALTON. They were not. But Dr. Taylor, who witnessed the firing from his piazza with marine glasses, said that at least one was seen to come up from Chatham and stood over the scene and returned to Chatham, and he told me that the submarine had headed north, although the newspapers say she went south.

Mr. BLODGETT. Is that all, Mr. Dalton?

Mr. DALTON. I guess, gentlemen, that is all. I thank you for your courtesy.

Mr. BLODGETT. Would you like to have the canal owned by the Government?

Mr. DALTON. I would like to have the canal free. Personally, I have just purchased a 12-ton boat, myself, and I am going into flounder dragging and the quahog and the clam business myself. I would rather it be a free canal, but what we need most of all is a harbor of refuge on the eastern end where fishing vessels of all kinds can come in.

STATEMENT OF MR. HARRISON BEARDSLEY, REPRESENTING THE STANDARD OIL CO. OF NEW YORK, MARINE DEPARTMENT, NEW YORK CITY.

Mr. BLODGETT. What is your full name?

Mr. BEARDSLEY. Harrison Beardsley.

Mr. BLODGETT. What is your occupation?

Mr. BEARDSLEY. Representing the Standard Oil Co. of New York, marine department.

Mr. BLODGETT. What kind of boats does your company use in the coastwise trade?

Mr. BEARDSLEY. Tank barges, towboat tugs, and tank steamers, which also tow barges.

Mr. BLODGETT. What dimensions?

Mr. BEARDSLEY. The barges run from 100 to 300 feet.

Mr. BLODGETT. What draft?

Mr. BEARDSLEY. Sixteen feet to 24 feet 6.

Mr. BLODGETT. And you carry oils exclusively?
Mr. BEARDSLEY. Petroleum and its products.
Mr. BLODGETT. And you are only engaged in your own business?
Mr. BEARDSLEY. Yes, sir.
Mr. BLODGETT. Did you say how many vessels you had?
Mr. BEARDSLEY. Well, in coastwise service we have about 40.
Col. NEWCOMER. That includes both barges and steamers?
Mr. BEARDSLEY. Yes.
Col. NEWCOMER. How about your steamers, the capacity and draft of your steamers?
Mr. BEARDSLEY. About 24 feet 6, I would say. That is the largest draft.
Mr. BLODGETT. And your steamers carry cargo as well as tow?
Mr. BEARDSLEY. Yes, sir.
Mr. BLODGETT. How many barges do you ordinarily tow with a steamer?
Mr. BEARDSLEY. Only one barge behind a steamer.
Mr BLODGETT. Have you at any time used the Cape Cod Canal?
Mt. BEARDSLEY. We use it about three times a month now with our steamer equipment.
Mr. BLODGETT. Your steam barges?
Mr. BEARDSLEY. Steamer barges and steamer tugs.
Mr. BLODGETT. What draft do you limit the use of it to?
Mr. BEARDSLEY. About 16 feet. In a report which was filed with Col. Potter in October, 1917, after a conference with our masters, our people advocated a minimum draft of 30 feet and a width of 200 feet.
Mr. BLODGETT. For the canal?
Mr. Beardsley. Yes.
Mr. BLODGETT. That never has been done?
Mr. BEARDSLEY. No.
Mr. BLODGETT. And would your people consider that an efficient canal, if it were made that width and depth?
Mr. BEARDSLEY. If it was made as stated, they feel that they would be able to send a large number of boats through there. We probably do not send more than about 15 per cent now.
Mr. BLODGETT. What percentage of your fleet would go through there under those circumstances, if it was equipped in that way?
Mr. BEARDSLEY. At least 75 per cent, I would say.
Mr. BLODGETT. And why would not the others go through?
Mr. BEARDSLEY. Because the steamers coming up from the south, the larger ones—
Mr. BLODGETT (interposing). They might go outside?
Mr. BEARDSLEY. Yes.
Mr. BLODGETT. But all of those that run coastwise would go through there, instead of going around the slue and cape?
Mr. BEARDSLEY. Yes.
Mr. BLODGETT. What do you say to the question of the Government taking this canal and equipping it properly and making it effective?
Mr. BEARDSLEY. I believe our people would be in favor of such a movement from the efficiency standpoint.
Mr. BLODGETT. Do you know how much oil or its products 75 per cent of your business would amount to in a year, in tonnage?
Mr. BEARDSLEY. Well, we furnished figures last year, and approximated the amount of tonnage to points north of the canal as 320,000 tons, which has been largely increased—this was last year, when we compiled these figures—and offhand, I should say now it would probably be about 400,000 tons.
Mr. BLODGETT. And in the judgment of your people and your masters, a width of 200 feet and a depth of 30 feet at mean low water would be satisfactory?
Mr. BEARDSLEY. Yes.
Col. NEWCOMER. Do your boats now use the canal light?
Mr. BEARDSLEY. Our larger equipment does not, for the reason that, as I understand it, the tug has always got the draft—the large tugs—which will be about 17 feet, whether they are towing light or a loaded barge. The tug would still have the draft. Our masters do not feel that is safe draft, and another objection is on account of the present width of the canal. You take two of these big barges and a towboat, our masters do not feel that they would make any time coming that way. They would have to wait for all tows coming in the opposite direction to pass through, and also a favorable tide, as I understand they go with this current.
Col. NEWCOMER. You would have to do that in any case, whether the Government owns it and enlarges it or not?

Mr. BEARDSLEY. You have two slack waters, if you had the depth there.

Col. NEWCOMER. With the boats light, apparently you would have all the depth you needed?

Mr. BEARDSLEY. I do not quite understand about that.

Gen. ABBOT. How do they regulate the traffic, if they have to wait for tows in both ends and they cannot pass in two directions and they both want to get in that water. Who decides the way the tows shall go?

Mr. BEARDSLEY. I assume the authorities who have control of the canal at the present time control that.

Gen. ABBOT. Is not that one reason they generally take the tows through with the favorable tide?

Mr. BEARDSLEY. Undoubtedly that is the reason they arrange it that way.

Mr. BLODGETT. I do not understand you are a practical navigator yourself?

Mr. BEARDSLEY. No; I am not.

Mr. BLODGETT. You are simply representing the operating end of the Standard Oil Co.?

Mr. BEARDSLEY. It is through talking with our masters.

Mr. BLODGETT. Do you know that one of your tugs, No. 4, passed west last Sunday afternoon with three empty barges?

Mr. BEARDSLEY. Why, I left New York Friday night, and at the time I left the tug was east, and I had not heard, because I was away.

Mr. BLODGETT. She did as a matter of fact go through going west Sunday afternoon.

Mr. BEARDSLEY. Tug 4 is one of the tugs that uses the canal as a rule. She is one of the small tugs, only 100 feet long, and the barges she had in tow were all small barges, so under the circumstances I would assume that the captain would use the canal, as it is left to his judgment.

Mr. BLODGETT. And your people are in favor of having it taken by the Government?

Mr. BEARDSLEY. I feel that they are.

Col. NEWCOMER. How many barges do you ordinarily take in a tow of one of your tugs?

Mr. BEARDSLEY. Two or three, lately two, but under normal conditions we take three.

Col. NEWCOMER. Why the difference?

Mr. BEARDSLEY. Well, we can not but feel that under present conditions there is a certain amount of hazard, and we had rather limit it to two, because the tug can get around better.

Col. NEWCOMER. On account of the submarine menace, you mean?

Mr. BEARDSLEY. Yes.

Col. NEWCOMER. Are there any other risks going around through the slue which your captains consider the worst way, if the canal was efficient?

Mr. BEARDSLEY. If the canal was efficient they would all use the canal in preference to going around the cape.

STATEMENT OF HENRY C. CADMUS, VICE PRESIDENT OF THE NEPTUNE LINE, BOSTON, MASS.

Mr. BLODGETT. You are the owner or representing the Neptune Line?

Mr. CADMUS. Vice president of the Neptune Line.

Mr. BLODGETT. In what business is that corporation?

Mr. CADMUS. Coal transportation by barges.

Mr. BLODGETT. From where to where?

Mr. CADMUS. New York ports and from Hampton Roads.

Mr. BLODGETT. What kind of barges do you use?

Mr. CADMUS. Ours are of the marine type, both from New York and the coast. Those on the coast are the ship hulls, converted ships.

Mr. BLODGETT. Do you use the canal?

Mr. CADMUS. We use the canal from New York exclusively.

Mr. BLODGETT. And how long have you been using it?

Mr. CADMUS. I started in last year. The Neptune Line started business a year ago last January. Previous to that I was in the transportation business for 19 or 20 years.

Mr. BLODGETT. Where are you from?

Mr. CADMUS. Boston. We always preferred the Sound business rather than to use Cape Cod.

Mr. BLODGETT. You did not go to Boston until the canal was built?

Mr. CADMUS. Yes. We started in last year.

Mr. BLODGETT. Was that on account of the slue channels?

Mr. CADMUS. We did not prefer the Boston business by way of Cape Cod by reason of the great detention.

Mr. BLODGETT. Just what do you mean by that?

Mr. CADMUS. Last year sometimes we would send a tow by way of the Vineyard, and in but one instance during the year 1917 did a tow leave New York and proceed to Boston without stopping at Vineyard Haven.

Mr. BLODGETT. How long did they have to stop?

Mr. CADMUS. These trips last year averaged about seven days from New York to Boston.

Mr. BLODGETT. How long from your experience did tows lay up in Vineyard Haven?

Mr. CADMUS. In that case it is three or four days.

Col. NEWCOMER. What is your average trip through the canal?

Mr. CADMUS. We brought back three barges from Boston in 36 hours.

Col. NEWCOMER. What is your average as compared with seven days?

Mr. CADMUS. If we make close connection with the canal, in about 48 to 52 hours.

Col. NEWCOMER. Suppose you did not make close connection?

Mr. CADMUS. It might run into 60 hours.

Col. NEWCOMER. What draft of barges did you say that you used?

Mr. CADMUS. The greatest draft I am using now is 7½ feet.

Col. NEWCOMER. And your tugs?

Mr. CADMUS. They are all of light draft. Some of them are licensed only for the canal route to Boston. I could not send them outside, and I have no desire to send them outside, because we can get the greatest dispatch in using the canal. In the last month I have made with two barges three round trips to Boston from the New York coal port in 32 days. I do not think that record was ever passed.

Mr. BLODGETT. How many tons of coal do you carry?

Mr. CADMUS. In June I think I put in 31,000 tons—30,963 tons—went through the canal during the calendar month of June.

Mr. BLODGETT. How much would you on an average carry through the canal?

Mr. CADMUS. I am figuring on making two round trips a month by the use of the canal.

Mr. BLODGETT. That would make how much in coal?

Mr. CADMUS. We are running 16 barges. They will average about 15,000 tons.

Col. NEWCOMER. Where do you lose so much time, if you make the trip in two days? Why should you take 30 days for the four trips?

Mr. CADMUS. There are always contingencies that arise at the loading port, and sometimes at the discharging port. Then perhaps a lack of tugs waiting to move. I was in Boston recently and a very prominent coal man of Boston informed me that he had a barge running regularly using the outside route, and in the year 1917 he made 11 trips in the year of 12 months. I can average 24 trips by using the canal.

Gen. HAINS. The same size vessels?

Mr. CADMUS. Yes; the same class of vessel exactly.

Col. NEWCOMER. Was that from the same point?

Mr. CADMUS. Yes; from New York Harbor.

Col. NEWCOMER. Perth Amboy?

Mr. CADMUS. It was an upper port, starting from Robbins Reef. That is where we usually make up our tows.

Col. NEWCOMER. So that from your business the canal is a great advantage?

Mr. CADMUS. Oh, absolutely. It is the salvation of New York at the present time.

Mr. BLODGETT. For coal?

Mr. CADMUS. For coal. No doubt about it. Our vessel fleet we are not running to Boston.

Mr. BLODGETT. Where are you running that?

Mr. CADMUS. Exclusively into Providence, to avoid the detention in going around Cape Cod, because they are too deep draft to go through the canal.

Mr. BLODGETT. What is that draft?

Mr. CADMUS. The greatest is 27 feet. The others will run from 24½ to 25 feet.

Mr. BLODGETT. Suppose the canal was taken by the Government and made efficient to a depth of 30 feet and maintained there, and with a width of 200 feet, or with passing places of 200 feet on the canal, would that increase the efficiency?

Mr. CADMUS. That fleet would then go through the canal.

Mr. BLODGETT. Your whole fleet?

Mr. CADMUS. Yes, indeed.

Mr. BLODGETT. How much in your judgment would it increase the efficiency of the coast fleet in carrying coal to the New England ports through the canal?

Mr. CADMUS. That is hard to arrive at, because during the last year part of the time we would go to Providence and part of the time to Boston, but I think the barges on the coast average from 12 to 14 trips.

Mr. BLODGETT. Would it materially increase the tow?

Mr. CADMUS. Absolutely. It is very seldom that we have had a tow whether coming to or from New York but what they stopped at the Vineyard.

Mr. BLODGETT. In your judgment could the canal be taken and made efficient by the Government and operated by them?

Mr. CADMUS. I consider it to be of greater advantage to commerce, because it could then be kept up in an efficient state.

Mr. BLODGETT. Has the canal ever been in an efficient state for vessels drawing over 16 or 17 feet to your knowledge?

Mr. CADMUS. That is the only class of vessel I have sent through. About a month ago I had a barge strike in the canal, only drawing about 16 feet. It was after passing through the Bourne Bridge.

Mr. BLODGETT. Do you know what tide she was going through on then, or do you know the facts about it?

Mr. CADMUS. No; I do not.

Mr. BLODGETT. Do you know whether she struck on the side?

Mr. CADMUS. No. We thought perhaps it might have been that there was some sunken dolphin that she might have struck on.

Mr. BLODGETT. You know you have a turn to get into the channel after going through the Bourne Bridge?

Mr. CADMUS. I have never been there but once, so I am not perfectly familiar with all of those points.

Mr. BLODGETT. And I suppose you would like to have the Government maintain free tolls?

Mr. CADMUS. That point I have not considered.

Mr. BLODGETT. I suppose that the freight rates now, you do not object to paying the tolls, but if the freight rates go back to 50 or 60 cents a ton, the tolls would be pretty high?

Mr. CADMUS. I do not know how we could pay them.

STATEMENT OF MR. JAMES HUGHS, JR., NEW YORK CITY.

Mr. BLODGETT. You are of New York?

Mr. HUGHS. On Broadway.

Mr. BLODGETT. And you are——

Mr. HUGHS (interposing). In the general transportation business.

Mr. BLODGETT. What line of boats do you run?

Mr. HUGHS. I deal exclusively in box barges, of the box type.

Mr. BLODGETT. Those are light draft?

Mr. HUGHS. About 12 foot, about 1,200 tons, the largest.

Mr. BLODGETT. And you take them in your own towboats?

Mr. HUGHS. And other towboats.

Mr. BLODGETT. How many are you operating at the present time?

Mr. HUGHS. Fifty-five in Long Island Sound.

Mr. BLODGETT. When did you begin operating these barges?

Mr. HUGHS. When the Cape Cod Canal was opened.

Mr. BLODGETT. Has your business gradually increased?

Mr. HUGHS. Yearly.

Mr. BLODGETT. From that time?

Mr. HUGHS. Yes, sir.

Mr. BLODGETT. Can you carry that tonnage in that fleet around the cape?

Mr. HUGHS. No, sir; they would have to stay this side of the cape, always did.

Mr. BLODGETT. How much tonnage in coal do you carry in a year? Can you give us that?

Mr. HUGHS. I could not very well give you that. I did take the tonnage of April, May, and June.

Mr. BLODGETT. Of this year?

Mr. HUGHS. Yes, sir.

Mr. BLODGETT. What is that?

Mr. HUGHS. In April 42,808 tons to Boston; in May 41,940 tons to Boston; in June 45,607 tons to Boston, all coal from New York coal ports to Boston, most of it going to the public utilities, such as the Boston & Maine and the Bay State Street Railway Co.

Mr. BLODGETT. That entire business, as I understand, has been built up since the opening of the canal?

Mr. HUGHS. Yes. The canal was the salvation of that business.

Mr. BLODGETT. And would go to pieces if the canal was allowed to go to pieces?

Mr. HUGHS. It would stop.

Mr. BLODGETT. What have you to say with reference to the advisability of the Government's taking the canal and making it efficient and keeping it so?

Mr. HUGHS. I am very much in favor of the Government taking it in the condition in which it is now and the way it is operated and handled. It is only a short while when it will stop. I am very familiar with canals. I have dealt with them, not only there but in the Delaware and Raritan, and the Chesapeake and Delaware, and if you do not keep up canals and remove submerged obstructions and maintain the walls, the canal becomes in a state of decay. At present the Cape Cod Canal is on that verge. Here only two or three weeks ago I had two box barges going through in tow of a tug drawing 11 feet 6, and suddenly they stopped near the Bourne Bridge. They were stopped for probably a minute, and then the tug went on, and when she got to Sandwich, about three quarters of an hour thereafter, the barge Catholine was next to it forward, and the captain of the tug used good judgment in getting in behind the dolphin where she sank. She was afterwards raised, and when hauled out in the dry dock it was found that her bow was stowed, just bulged in, about 12 planks broken in, about 2 feet, and I am sure that pressure did not do it.

Col. ROESSLER. Were you in the middle of the channel at the time?

Mr. HUGHS. Yes, sir; according to the captain of the tug's statement, he was in the channel. I myself was not there, and I am taking his statement. I followed up the Cape Cod Canal when they first started to dig. I furnished the contractors most of the floating equipment that it took to build it, and for the first four years I spent about 100 trips there. Of course, every time I was going through, Jimmy was making a dollar, selling them a new boat or something, but it gave me the experience that other people are lacking. The dolphins were built as Mr. Scott formerly stated. We have broken them down by running into them by a tug, and we found in many cases they were eaten off with worms, which in my opinion is happening to-day. These dolphins will naturally decay and sink and cause more trouble.

Col. NEWCOMER. Where have you found them that are eaten?

Mr. HUGHS. At the Buzzards Bay end. The contracting company that done the wash walling and making the breakwater; in one month the entire bottoms of the barges were eaten out. The wash walling on the canal, I watched that as it progressed, and I have watched it since, and it is more than half below the surface to-day. The condition of the canal, as I said before, is fast decaying, and if something is not done, New England is going to be in bad shape. With Government ownership of the Cape Cod Canal, we would then feel that it would be wise to continue building the proper equipment to carry coal. It would quickly add a lot of new tonnage. To-day we can build a 1,200-ton coal-box barge at a cost of $20,000. She is operated by one man at a cost of wages and upkeep of about $200 a month. That same barge to go via the outside route would cost to-day at least $75,000. In fact, I noticed in the papers a few days ago where the Government has given a contract to build 25 barges that will carry 2,500 tons each at $195,000 apiece.

Mr. BLODGETT. What kind of barges?

Mr. HUGHS. Coastwise barges, seagoing barges. It does not require as expensive power to tow the coal from New York to Boston via the canal in a box-type barge, as it does in a seagoing barge.

Mr. BLODGETT. Why is that?

Mr. HUGHS. We are not subject to the seagoing regulations of the board of inspectors. We do not have to carry but a captain and a mate, where the outside boat has to carry the captain and two mates. So does the engine department. We do not have to figure on having as good a bunker space, because we can get both at Boston and New York.

Mr. BLODGETT. Do you carry the same crew?

Mr. HUGHS. The biggest has one man.

Mr. BLODGETT. And the ocean man has——

Mr. HUGHS. Five.

Mr. BLODGETT. Three to five, is it not?

Mr. HUGHS. Three to five.

Col. NEWCOMER. How many box barges do you take in a tow?

Mr. HUGHS. Until Uncle Sam put a net across Newport we used to take three. Now we take two. The reason for that is this: When we leave New London, Newport is the first harbor. We are not permitted to go in through the net on a long hawser. Therefore we had to shorten up. Our tugs have a capstan aboard that can pull in a hawser. They can let a hawser go between the first and second boat and pull the first boat away from the second boat. The third boat, he can not control her, and therefore we have to leave her in New London, which has cut down the efficiency of the tug to us operating between New York and Boston in box barges 33⅓ per cent. I have taken right in the canal itself four loaded box barges from Wings Neck to Sandwich and taken four light from Sandwich to Wings Neck.

Col. NEWCOMER. Those are all taken on the hawser, of course?

Mr. HUGHS. Make them up alongside of one another, the same as these two books (indicating), two on the stern and two hawsers to the tug.

Mr. BLODGETT. Mr. Hughs, what do you say should be done to the canal to make it efficient for practically the entire coastwise trade, barges and steamers, to make them use the canal?

Mr. HUGHS. I would highly recommend the widening and deepening of the canal.

Mr. BLODGETT. To what width and depth?

Mr. HUGHS. At least 200 feet width.

Mr. BLODGETT. At the bottom?

Mr. HUGHS. At the bottom, and at least 30 feet depth, and we think by doing that it would greatly reduce the present current, and in addition to that I would recommend that there be an ice breaker—I am giving you this from actual experience—maintained in Buzzards Bay. Last winter I had five boats tied up there for three months, frozen in; yet there was never any ice in the canal.

Mr. BLODGETT. That was outside of the canal?

Mr. HUGHS. It was in Buzzards Bay. From Buzzards Bay down to Wings Neck. And, while last winter was a very severe winter, yet the winter before was not so severe, and during the latter part of January and the entire month of February I was also caught with seven boxes that were loaded with coal. Some had coal on and some were light. Most any kind of a tugboat is good enough to tow a box from Sandwich to Boston. It is only a matter of about 56 miles, and it has a very good harbor known as Plymouth. Oftentimes we use it. We have had our box-barge tows broken up off Boston Light, and in some cases the water was too heavy for the tug and we let the tow go. They are seaworthy in every respect and the reason is this, to not overload them. We maintain by reason of compulsion—I do not know that we would do it if we were not compelled by the insurance companies—to only carry three-quarters of the total capacity of the boats when we go east of New London. The boat that I have recently purchased—it is not finished yet—I figure that she will carry 1,500 tons, and I hope to get away with carrying 1,200 tons on her to Boston.

Mr. BLODGETT. How much of the coastwise traffic do you figure will use the canal provided it is made efficient as you have described and maintained so by the Government—for what proportionate part?

Mr. HUGHS. On the coal I think you would never see a cargo of coal go outside of Cape Cod, and on the steamer line, it will only be a short while when the managers of the steamship companies will quickly see that that is the best route for them to take.

Mr. BLODGETT. How about the oilers?

Mr. HUGHS. Exclusively.

Mr. BLODGETT. How about the Merchants & Miners?

Mr. HUGHS. They are a steamship line and they are using it today. They were opposed to it, but when the submarine drove them to it they have used the canal.

Col. NEWCOMER. This Newport net that you speak about, does that affect your route?

Mr. HUGHS. Very seriously. In case bad weather comes up from the time we leave New London until we get to Newport, it affects us very seriously. And then another thing, we can only go into Newport in daylight. If we get off there in the evening we have to remain there until daylight.

Col. NEWCOMER. Do you make that a regular stop?

Mr. HUGHS. No; we only use it as a harbor of refuge in case of bad weather. We have a stretch of nine hours from New London to Point Judith, and many times the weather changes in that nine hours, and I think that every coal carrying road, including the Lehigh Valley, which is unfortunate in losing their tugs and barges, would be using the Cape Cod Canal if their superintendents would cooperate a little more than they do. I do not see any reason why they should want to be permitted to stick their noses outside of Cape Cod, even in the condition the canal is, provided it is maintained properly.

Col. NEWCOMER. You think it is largely prejudice on their part?

Mr. HUGHS. I do.

Mr. BLODGETT. Does that mean that there should be 25 feet or the depth that is there now?

Mr. HUGHS. The depth that is there now, if it was properly maintained.

Mr. BLODGETT. But that would not accommodate nearly all the coastwise traffic?

Mr. HUGHS. Oh, no.

Mr. BLODGETT. And what proportion of the coastwise traffic is accommodated there now or can be with the present depth?

Mr. HUGHS. You might accommodate 50 or 60 per cent of it. You would do well if you can do that. It is my opinion, if the Government took hold of that canal today, inside of a month's time, they could have it back in the same shape it was in the day it was opened. As Mr. Scott has explained to you, a bowlder on one side will form a

bar on the other side. Those bowlders may be small, but they will form a bar. A big stump of a tree will catch in there, and then it will soon pile the same as the ants pile sand.

Mr. BLODGETT. In your judgment a dredge should be kept operating more or less——

Mr. HUGHS. There should be a dredge in there to-morrow, and there should be a tow boat there, or two tow boats, owned and operated by somebody, whether there was any money in it or not, to move the present obstructions. I have advocated to Mr. James J. Sturkey, the fuel administrator, to get from the Government some way or other three or four tow boats and put them there. There are often times when we have to wait 8 or 10 hours for the tide to go through, and had the boat been at Sandwich, we would have been that much farther on to Boston. It takes about 13 hours for a fair sized tug boat to go from Sandwich to Boston with two barges.

Col. NEWCOMER. What is the ordinary time from Wings Neck to Sandwich?

Mr. HUGHS. About two hours. It takes about three quarters of an hour to go from Wings Neck to Buzzards Bay and about one hour to go through the canal.

Col. NEWCOMER. You only go through with the current?

Mr. HUGHS. With the current. That is the only way any vessels can go through except the passenger steamers and big steamers. All towing barges go through with the current.

Col. NEWCOMER. The large barges go through against the current?

Mr. HUGHS. They do not generally do that.

Mr. BLODGETT. I think that is all.

STATEMENT OF MR. A. E. BECK, TRAFFIC MANAGER THE MERCHANTS AND MANUFACTURERS ASSOCIATION, BALTIMORE, MD.

Mr. BLODGETT. Your full name is A. E. Beck?

Mr. BECK. Yes, sir.

Mr. BLODGETT. And you come from Baltimore?

Mr. BECK. Yes, sir.

Mr. BLODGETT. And you are traffic manager for the Merchants & Manufacturers Association?

Mr. BECK. I am.

Mr. BLODGETT. What is that association?

Mr. BECK. It is a voluntary association of merchants and manufacturers of the city of Baltimore and the State of Maryland.

Mr. BLODGETT. What business does it do with reference to the use of this canal?

Mr. BECK. If you will permit me to go along in a general way, I think I can give you just what you want?

Mr. BLODGETT. All right.

Mr. BECK. Mr, Chairman and gentlemen, Baltimore is dependent in a very large measure upon Boston and the New England territory. We receive from that part of the country enormous shipments of woolen goods, boots and shoes, rubber goods, novelties, art ware, canned goods, and things of that sort. We ship from and through Baltimore to that territory quantities of wool, soda, fertilizer, and other commodities.

Prior to December, 1916, we enjoyed the service of the Merchants & Miners Transportation Co., the line between Baltimore and Providence. On that date the line was withdrawn and we were therefore made dependent entirely upon the all-rail line or else a combination that might be affected by using one of the steamer lines down to New York from Boston or Providence, thence a haul across the city in connection with the New York & Baltimore Transportation Line from New York to Baltimore, or we might take the Merchants & Miners Transportation Co. steamer from Boston to Philadelphia and thence in connection with the Ericson Line, through the Chesapeake & Delaware Canal to Baltimore, or we might take the Merchants & Miners to Norfolk, and thence in connection with one of the Norfolk steamers to Baltimore. But you will notice that in each instance there is a rehandling, besides the transfer from the terminal of one company to the terminal of another, making the cost of transportation excessive, and on account of the rehandling sometimes extremely hazardous.

We have for quite a little while, some several months, endeavored to interest the committee on inland waterways of the Railroad Administration in the advisability of supplementing the present rail service with a barge service operating from Boston through the Cape Cod Canal, Long Island Sound to New York, and thence through the Delaware & Raritan Canal down to Philadelphia, and thence through the Chesapeake & Delaware Canal to Baltimore, continuing on and through the Albemarle and Pamlico Sounds.

We have also advocated the operation of barges to the outside coast cities, Savannah, Charleston, Wilmington, and even as far south as Jacksonville. They have just recently so I am informed, recommended to the Railroad Administration the operation of a

line of barges from Philadelphia to Baltimore, and when I say Philadelphia, that means through the Chesapeake & Delaware Canal and down the Chesapeake to Norfolk and thence to Elizabeth City, Washington, and Newbern, N. C., where it is contemplated that merchandise handled in connection with these barges be transferred to the rail lines and forwarded to southern destinations.

Baltimore supplies the greater portion of the south and southeast with a great quantity of the essentials of life. We have been most severely handicapped ever since the United States entered into this war by reason of the curtailment, first, of the rail service. I will not say failure, because it has not been a failure in all instances. We have found ourselves face to face with a situation which in railroad circles is known as passing freight through the neck of a bottle. On the northeast we have the Harlem River transfer; that is to say, shipments moving from New England in connection with the New York, New Haven & Hartford Railroad, through the Harlem River transfer, where it is in turn handled by the Pennsylvania Railroad Co. And then on the south, we have the Potomac Yard situation, which is identically similar to what we have on the Harlem River transfer. That means as the freight in quantities is offered to the various connecting lines through these gateways accumulates, the congestion becomes so great that an embargo is the inevitable result, and then we are tied hand and foot.

In the case of New England freight, last winter for practically four months we found it impossible to use the rail lines. We were handicapped by the elimination of the Merchants & Miners service between Boston, Providence, and Baltimore, and we were forced to depend entirely upon the movement in connection with one of the water lines out of Boston and Providence to either New York, Philadelphia, or Norfolk. As I say, that service was instituted for the reasons I mentioned in the beginning of this statement.

Now, we believe that there is only one solution of the problem. The Government, as you gentlemen know, has begun condemnation proceedings, as we understand it, in the case of the Chesapeake and Delaware Canal. The Railroad Administration is at the present time in control of the Delaware and Raritan Canal. This Cape Cod Canal is the only one in the hands of private owners.

With the view that we take of it, and profiting by the experience of those versed in canal operation, we do not believe that the plan of through transportation by means of these barges—and when I refer to through transportation, I do not mean for solid cargo lots such as the gentlemen who have preceded me have testified to, coal and other bulky freight—but I am speaking now, of the package freight, the merchandise trade which is of great value and a vital necessity to the people of the country, we do not believe that a missing link, we might say, will be wise in the through operation, because our plan contemplates not only the delivery of freight or the handling of freight locally between Boston and Providence and Baltimore, or from Boston and Providence to New York, but it also contemplates the forwarding of that freight through to some southern connection, Norfolk or south, if you please, with the rail lines that will handle it through to destination, and which rail lines are not at all congested.

Gen. ABBOT. To get rid of the yards around New York City and the other large cities?

Mr. BECK. Exactly so. The testimony of one of the Railroad Administration just a week or so ago was to the effect that the southern lines up to the Potomac yards and Ohio River gate crossings were operating only about 50 per cent capacity. The efficiency of our remaining steamer lines has been almost entirely destroyed by reason of a ruling of the Railroad Administration—I say this advisedly; it is perhaps brought about by good and sufficient reasons, but the result has been to seriously interfere with our coastwise transportation, so far as it remained to us.

The idea of the Railroad Administration is that this coming winter will see even greater use of our ports than we have had heretofore. We are given to understand that the capacity of these ports will be most severely taxed. I have not any doubt but what that is a fact, as our armies in Europe must be maintained, the people of Europe must be fed and clothed, and preparations, of course, are going on at the present time for those needs. That business will have to be moved, and it will have to be moved through the ports. We know that, but one of the committees of the Railroad Administration has ruled that, in order to keep those ports clear, the steamer lines out of the ports must not go beyond a radius of from 100 to 150 miles for cargo. The net result of that order is that it limits steamer lines to practically a port to port business, and I doubt if any of our ports beyond the port of New York has business sufficient to justify the operation of steamer lines between the north Atlantic and the south Atlantic ports.

An attempt is now being made to overcome that, but so far without result. I do not think we will get any relief, and do not think that we will be able to permit the

steamer lines to draw the heavy bottom tonnage it is necessary to continue in operation, at least until the coming winter, when the crisis, I hope, will be passed.

Gentlemen, in reference to this matter, we—and I say "we," and I mean Baltimore to the New England ports through Boston and Providence—in presenting this matter to the Railroad Administration, or at least the Committee on Inland Waterways, I was asked to prepare and submit a brief, which I have done, and which I would like at this time to file and leave with the board. That shows some very interesting facts in connection with the tonnage moved during the year 1916, which I have selected as a typical year.

That statement shows briefly that there were 7,300 tons of boots and shoes moved over the Merchants & Miners Line for that year. There were 1,100 tons of rubber boots and shoes. There were 9,000 tons of dry goods, and of miscellaneous freight there were 14,000 tons. So far as we have been able to determine, there is approximately 100,000 tons of miscellaneous goods handled between New England territory and Baltimore. There is one thing that might occur to you gentlemen when we stress the importance of the operation of this canal, or at least the operation of the barge lines through the canal, and that is whether our interests will decline after the war. I think I can answer that in the negative for the simple reason that while there has been great industrial development in New England since the beginning of the war, in my opinion those industries that are at present engaged in the manufacture of munitions of war will be turned into the manufacture of articles for domestic consumption.

I think that in the amortization of the capital that is invested in these profits, there will be a trend toward domestic manufacture, rather than an abandonment of the factories that have been constructed and that are now devoted to the manufacture of munitions of war.

So far as volume is concerned, we can see through the movement of tonnage that we have to offer and which we have moved and which we have stored in our warehouses and are unable to move even at the present time, sufficient tonnage to justify the uninterrupted operation of barge lines from Boston along the route that I have named to the southern ports.

Gen. ABBOT. That is package freight barge lines?

Mr. BECK. Yes, sir.

Gen. ABBOT. And properly constructed to carry valuable freight without damage?

Mr. BECK. That is the idea.

Col. NEWCOMER. Is your interest in the Cape Cod Canal primarily, then, as a link in this intercoastal route?

Mr. BECK. Yes, sir.

Col. NEWCOMER. Of course, as a link in that intercoastal route, it would not need to have any greater dimensions than it has?

Mr. BECK. That is one thing with which we have no particular interest.

Col. NEWCOMER. To what extent are you interested in public ownership of that canal?

Mr. BECK. We believe that only by that means, if the operation of the other canals or rather the operation of barges through the other canals, is begun by the Government, and they desire to extend the operation of those barges through to Boston, that only by Government ownership and operation are you going to be able to get the best results. You are not then pestered with petty annoyances on the part of private owners.

Gen. ABBOT. How about the Government taking over the control and operating it now the way it does the railroads?

Mr. BECK. That may be all right as a temporary expedient, but there will a day come when the war will be over. We feel that the Government should continue the operation of the canal, so that these barge lines may not be put out of business.

Col. NEWCOMER. Do you think a barge line from Boston to Baltimore could compete in any sense with an outside boat?

Mr. BECK. Yes, sir, I do, for the reason that we have a very peculiar situation there with relation to the rate adjustment. So far as I know, the outside boat lines between Boston and Baltimore are the only boat lines that have continued a rate adjustment that was the same as the railroads. In other words, the service in connection with the outside lines was no better than the railroads in normal times were able to offer, and the rates were the same all rail or all water.

Col. NEWCOMER. Who is responsible for that arrangement?

Mr. BECK. I imagine the New York, New Haven & Hartford Railroad was originally responsible for it, but it has been continued under private ownership. I believe that the operation of a barge line a shorter distance at a less cost of operation would compete.

Col. NEWCOMER. You speak of a shorter distance?

Mr. BECK. I should have said a less hazardous journey.

Col. NEWCOMER. What size barge would you take through the Delaware and Raritan Canal?

Mr. BECK. I am given to understand that a barge drawing 9 feet of water can go up through there at the present time.

Col. NEWCOMER. I think that is right questionable.

Mr. BECK. That is my information. I am not positive of it.

Col. NEWCOMER. What width and length?

Mr. BECK. I do not know.

Col. NEWCOMER. The locks are small?

Mr. BECK. I understand so.

Col. NEWCOMER. It will take through small barges?

Mr. BECK. I was talking the other day with a captain who was engaged in piloting barges through the canal, and he said in one or two places they scraped bottom and top, too.

Col. NEWCOMER. It will not take large size barges?

Mr. BECK. No.

Col. NEWCOMER. And if you are going to be confined to the type of boat you will take through there, you can not compete with the railroad rates?

Mr. BECK. So far as we are concerned, we are interested only in the transportation of package freight, and that is a very small proportion of the whole. We only have, so far as we can determine, something slightly over 100,000 tons of that a year, and of course there are millions of tons of commodities even from Baltimore itself. Figures show in normal times there was 5,000,000 tons between Baltimore and New England.

Col. NEWCOMER. None of that coal wants to go through that route?

Mr. BECK. No.

Col. NEWCOMER. If the coal goes cheaper outside, why should not the other go cheaper?

Mr. BECK. We have not any service outside at the present time.

Col. NEWCOMER. That is simply a question of putting on boats?

Mr. BECK. We have not any boats.

Col. NEWCOMER. You have not any boats for the inside, either.

Mr. BECK. It is a great deal easier, in the judgment of the Railroad Administration, to obtain these canal boats and barges than steamers.

Col. NEWCOMER. They are turning them out pretty rapidly.

Mr. BECK. I know, but they are also finding use in overseas service for them, and they are turning out barges in the North Carolina section pretty rapidly. Those barges, some of them, will be placed on the Chesapeake & Ohio Canal, and others through the Chesapeake & Delaware.

Col. NEWCOMER. But none of them are being built small enough to go through the Delaware & Raritan?

Mr. BECK. Just at this time, no; but their plans contemplate, I believe, the construction of boats that will use the Delaware & Raritan Canal.

Col. NEWCOMER. That is a very limited waterway, you know, many bridges and small locks?

Mr. BECK. I have never seen it, but I understand that it is; but the plan that we have and which we find concurred in by the Railroad Administration is to use that route as a supplementary form of transportation. They realize that the railroads are unable to take care of it.

Gen. ABBOT. Then it is an emergency measure and your comparatively high-priced package freight can afford to pay for transportation?

Mr. BECK. Just at the present time, the cost of transportation is inconsequential. It is a question of service. It is service we want, and what we need and must have. The cost is immaterial, but we do feel that in time the Government through its operation at the present time of the Delaware & Raritan Canal will widen it and deepen it, and that the same thing will be done to the Chesapeake & Delaware, if it is to be used as a national adjunct, so that also in time we will be permitted or be enabled to operate any sized barge through from the Chesapeake to Buzzards Bay.

I think that is all that I have, Mr. Chairman, to say.

Mr. BLODGETT. I thank you very much, Mr. Beck.

(The brief referred to and submitted by Mr. Beck is as follows:)

BRIEF OF THE FACTS IN SUPPORT OF BALTIMORE'S APPLICATIONS FOR INTERCOASTAL BARGE SERVICE.

[By A. E. Beck, traffic manager.]

New England service from Baltimore.—Prior to December 1, 1917, Baltimore enjoyed a coastwise service to Boston and Providence to the extent of three sailings a week to Boston and three a week to Providence via the Merchants & Miners Transportation Co. This company has sold within the last two years 10 of its steamers, 2 having been turned into cargo carriers, 1 has been lost, and 1 disabled, leaving from an original 26 steamers only 11 to be used on all of the lines of the company. Coming as this did at the time when munition shipments were heaviest from New England and raw material and coal were being extensively shipped into New England, the unprecedented congestion occurred that absolutely isolated for many months this section of the country from the rest of the United States and Baltimore suffered even more extensively than many other commercial centers, because of the fact that Baltimore draws very largely upon New England for its jobbers' stocks of goods.

The elimination of this service by water, and the congestion of the rail lines, left Baltimore with practically no service from or to New England, so that as soon as the United States Railroad Administration assumed control of the water lines a conference was arranged with Mr. Louis J. Spence in New York before whom was laid all the facts at the command of themerchants and manufacturers of Baltimore praying for the installation of some sort of service by water. At that time a statement was filed with Mr. Spence, which was compiled from both the records of the Merchants & Miners Transportation Co., and of our merchants and manufacturers, showing that for the calendar year of 1916, which year, while a little better than 1913, and not quite so good from an operating standpoint as 1917, was fairly typical of a normal year, a movement northbound of 37,120 tons, together with a southbound tonnage of 38,188, or a total of 75,308 tons. In the northbound movement there were 3,500 tons of canned goods, 2,000 tons of wool, 1,550 tons of hides and leather, 2,350 tons of oil, 2,300 tons of special iron and hardware, 2,300 tons of wines and liquors, 2,100 tons of soda, with a miscellaneous freight estimated at 16,000 tons.

In the southbound tonnage, there was a movement of 1,250 tons of potatoes, 1,535 tons of canned sea food, 7,300 tons of boots and shoes (leather), and 1,100 tons of boots and shoes (rubber). Dry goods moved in the same direction to the extent of 9,000 tons. Paper, 1,745 tons, with a miscellaneous tonnage of 14,000 in the southbound direction.

At the present time Baltimore has no water service between that port and Boston and Providence, being dependent upon a service of the Merchants & Miners Transportation Co. to Norfolk and thence in combination with the Bay Lines to Baltimore, or the use of the sound line steamers to New York, with a drayage across the city, and thence the New York & Baltimore Transportation Line to Baltimore, or the Merchants & Miners Transportation Line to Philadelphia, with a drayage service across the city, thence to Baltimore in connection with the Baltimore & Philadelphia Steamboat Co.

The operation of a barge line from Baltimore through the Chesapeake & Delaware Canal, thence through the Raritan Canal to New York and the Sound to Providence, thence the Cape Cod Canal to Boston, would provide a service that as far as the New England trade is concerned would prove a salvation to Baltimore and its trade territory, because it is a physical impossibility to ship goods by rail through the neck of the bottle at Harlem River Transfer or through the Central New England Railroad in connection with the New York Central.

Southeastern service from Baltimore.—For a greater number of years approximately 75 per cent of Baltimore's traffic with the south, southeast, and Carolinas has been in connection with the rail and water lines. A choice of three routes was afforded. The two Baltimore-Norfolk Lines, the Chesapeake Steamship Co., and the Baltimore Steam Packet Co., connecting through Norfolk with the Southern Railway, the Atlantic Coast Line, the Seaboard Air Line, the Norfolk & Western, the Norfolk Southern, the Chesapeake & Ohio and Virginian Railway; the Merchants & Miners Transportation Co. to Savannah, connecting with the Atlantic Coast Line, the Central of Georgia, the Seaboard Air Line and Southern Railway, and to Jacksonville, connecting with the Atlantic Coast Line, Florida East Coast, Georgia Southern & Florida, the Seaboard Air Line, Southern Railway; the Baltimore & Carolina Steamship Co. to Wilmington, connecting with the Atlantic Coast Line and Seaboard Air Line, Charleston, S. C., Atlantic Coast Line, the Seaboard Air Line & Southern Railway, and to Georgetown, S. C., connecting with the Seaboard Air Line.

Formerly, and prior to just a few months ago, Baltimore had two sailings a week via the Merchants & Miners Transportation Co., two sailings daily to Norfolk, one via the Baltimore Steam Packet Co., and one via the Chesapeake Steamship Co., and one fortnightly sailing via the Baltimore & Carolina Steamship Co. At present there is only one sailing a week to Savannah and Jacksonville via the Merchants & Miners Transportation Co., one sailing semimonthly via the Baltimore & Carolina steamship Co. and one daily sailing to Norfolk via the Baltimore Steam Packet Co. and the Chesapeake Steamship Co. The Baltimore & Carolina Steamship Co. formerly operated through Wilmington, as well as through Charleston and Georgetown, S. C., but they were ousted from that port through the instrumentalities of the railroads.

A survey of the tonnage of these lines for the calendar year of 1916 shows that the Merchants & Miners Transportation Co. hauled 182,179 tons of local Baltimore freight and 138s119 tons of freight from or to connections; the Baltimore Steam Packet Co., commonly known and referred to as the Old Bay Line, handled 194,634 tons of local Baltimore freight and 101,944 tons of freight from or to connections; the Chesapeake Steamship Co. is credited with 179,879 tons of local Baltimore freight with 112,553 tons of freight from or to connections; the Baltimore & Carolina Steamship Co. handled 38,513 tons of local Baltimore freight and 34,647 tons of freight from or to connections, making a grand total of 982,468 tons, approximating 1,000,000 tons of freight handled by these lines serving the south and southeast.

Of that tonnage, the Baltimore-Norfolk Lines handled approximately 50.000 tons of tobacco, 22,000 tons of cotton, 90,000 tons of fruits and vegetables, 20.000 tons of poultry, game and fish, 25,000 tons of animal products, 20,000 tons of petroleum and its products, 12,000 tons of sugar, 9,000 tons of machinery, 20,000 tons of wines, liquors and beers, and about 260,000 tons of manufactured articles not specifically included in the enumerated articles. While impossible to ascertain the selected tonnage of the Merchants & Miners Transportation Co., it is safe to say that the proportion of tonnage on the Savannah-Jacksonville Line is about the same as is shown in the operations of the Baltimore Norfolk Lines.

The operation of a line or lines of barges from Baltimore to serve the South through Norfolk, Beaufort Inlet, Albemarle Canal, Pamlico Sound to Washington, N. C., connecting with the Atlantic Coast Line and Norfolk Southern, Elizabeth City, N. C., connecting with the Norfolk Southern, and New Bern, N. C., connecting with the Atlantic Coast Line and Norfolk Southern, will do much to relieve the congestion that exists and is bound to continue to exist through Norfolk by reason of the continuation of labor difficulties at that point, together with the reduction of service by the Merchants & Miners Transportation Co. in their Savannah-Jacksonville Line, and the probable discontinuance of sailings by the Baltimore & Carolina Steamship Co. ports of the United States Railroad Administration, limiting the steamer lines operating from the ports to a cargo radius of between 100 and 150 miles. This ruling does not permit the steamer lines to obtain the heavy bottom cargo necessary for stability and seaway from Pittsburgh and other manufacturing centers, and in effect practically confines the lines to a port-to-port business. The object of this order is apparently to take away from the port business that was formerly handled in connection with the water lines and to transfer it to the rail lines for movement via and through the Ohio River gateways, such as Cincinnati, Louisville, Evansville, Cairo, etc., and this will undoubtedly result in a worse congestion than has heretofore existed, because of the leeway that has arisen previously from the moderate use of these Ohio River gateways.

There is also at the present time and has been for years past a very heavy movement by schooner of cement and fertilizer from Baltimore to southern ports, and phosphate rock, sulphur, and lumber from the southern ports to Baltimore, but as there are no port statistics maintained that will permit the aggregation of this tonnage, only an estimate can be made which is reliably placed at 500,000 tons, making a total of water-borne tonnage between Baltimore and the South and Southeast of approximately a million and a half tons.

It is impossible to predict the proportion of this tonnage that would find its way to the barge lines, but it is safe to predict and assurances are given by the merchants and manufacturers of Baltimore that enough tonnage will be found for transportation by these barges as there can be found barges to transport, the thought uppermost in the minds of the shippers and consignees at this moment being that it is service that is wanted and that there must be some supplementary form of transportation afforded to that which is at present applicable.

More and more steamers are being demanded by the Railroad Administration for the movement of lumber and cotton, and in all probability with the approach of winter other uses will be found for these steamers, so there is apparent a constantly decreasing supply that will be available for the merchandise service of the eastern part of the country, and upon this service for livelihood must depend the people of that country,

so that in effect it is imperative that relief be afforded, and this relief is very clearly seen in the operation of barge lines as is projected or contemplated.

Terminal Situation:

Baltimore has been able to adequately care for its export and import traffic, and at the present time ships are being loaded with regularity and dispatched on their journey, this being accomplished in large measure by the unloading upon railroad property of pig iron, casting, and rough freight. The dock facilities are amply adequate to take care of any barge line inaugurated, and for the majority of shippers and consignees hauls from and to the docks equals hauls from and to the freight stations, the only exception being those industries which have the benefit of industrial sidings.

The traffic situation of the Atlantic seaboard could in the opinion of expert traffic men be readjusted to a basis that would negative the possibility of as serious results as have been experienced in the past by the embargoing of solid carload shipments from one consignor to one consignee, confining the movement of these cars to the rail line and transferring the merchandise traffic to the steamer line, when for rail and water movement, or to the barge line and the rail line, if the barge lines are placed in operation.

At any event, the barge line affording a supplementary form of transportation is exactly the mode of transportation necessary at this particular time, and we believe in the future, to handle the constantly increasing traffic of the seaboard section of the country.

STATEMENT OF CAPT. HAROLD L. COLBETH, SUPERINTENDENT OF CAPE COD CANAL CO., BOSTON, MASS.

Mr. BLODGETT. You have been to sea a good many years?

Capt. COLBETH. Yes.

Mr. BLODGETT. As a master mariner?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. How many years have you been a master mariner?

Capt. COLBETH. Since 1907.

Mr. BLODGETT. What kind of ships and boats have you been in command of?

Capt. COLBETH. Freight steamers, and in both coastwise and foreign trade.

Mr. BLODGETT. You are now employed by the canal company in charge of the operation of the canal?

Capt. COLBETH. Yes.

Mr. BLODGETT. How long have you been there?

Capt. COLBETH. Since February, 1917.

Mr. BLODGETT. Prior to that what business were you engaged in?

Capt. COLBETH. Steamers of the Eastern Steamship Co. Lines?

Mr. BLODGETT. Did you ever operate the Harvard and Yale?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. Around through the slough?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. And you have operated in the other boats through the canal since the canal has been opened?

Capt. COLBETH. During the year 1916.

Mr. BLODGETT. Will you tell us a little in your own language about the ins and outs of this canal, and the operation of it for boats of the kind you are used to?

Capt. COLBETH. All of the men that I sailed with, all of the officers agree, that the worst condition of tide and water in the canal was better than the best condition operating across Nantucket Shoals, considering the fogs and stormy weather, the circuitous tides and the shoals, as well as the congested shipping in the channels across the shoals.

Gen. ABBOT. If the canal is used a great deal, won't there be congestion of shipping in the canal too?

Capt. COLBETH. That is possible, but that takes into consideration, too, the fact that the canal will be wider when the shipping becomes congested.

Gen. ABBOT. It is entirely dependent on the widening?

Capt. COLBETH. To care for a great deal more shipping than we have, yes sir, and larger ships.

Mr. BLODGETT. What is the condition of the canal at the present time and what is the depth of boats that in your opinion can go through there safely?

Capt. COLBETH. 19 feet.

Mr. BLODGETT. 19 feet draft of water?

Capt. COLBETH. 19 feet draft of water.

Mr. BLODGETT. And how much would that leave in the canal at the shallowest place under it?

Capt. COLBETH. About four and one-half feet.

Col. NEWCOMER. That is going through at high tide?

Capt. COLBETH. Yes, sir. We have passed a 19 foot boat at dead low water without accident.

Col. NEWCOMER. How recently?

Capt. COLBETH. Within the last 8 or 9 months, and we have a barge that draws 18½ feet that goes through regularly.

Col. NEWCOMER. Without reference to stage of tide?

Capt. COLBETH. Yes, sir.

Col. NEWCOMER. Then by limiting themselves to high tide, they ought to go through with more than that?

Capt. COLBETH. Why, yes, but we like to have a margin of safety, and I do not want a boat there drawing over 20 feet at present, although it is possible to take one drawing over 22.

Mr. BLODGETT. If a master should apply to you for permission to go through there on high tide with a 22 or 23 foot draft, would you let him go?

Capt. COLBETH. If it was a good handled ship, and the conditions warranted him taking a little chance, I would say yes.

Mr. BLODGETT. Where would you feel you would stop taking a chance—at what leeway?

Capt. COLBETH. At 19 feet draft.

Mr. BLODGETT. In other words, you think you want 4 or 4½ feet at least?

Capt. COLBETH. Yes, sir, and it has been the policy of the canal company for the last year and a half to manage the canal on an ultra-conservative policy, and that is the policy I have been following.

Mr. BLODGETT. Your 18-foot boat coming through without reference to tide does not always have 4½ feet under her?

Capt. COLBETH. No, indeed; but she does not always come at low water.

Mr. BLODGETT. Do you take any responsibility in putting vessels through, or do you let them take their own responsibility?

Capt. COLBETH. The only vessels I go on board are the larger vessels. I go on board the larger vessels myself and assume charge and arrange for every detail of the passage.

Col. NEWCOMER. Does that mean that the canal company assumes any responsibility for the risks?

Capt. COLBETH. No, sir.

Col. NEWCOMER. That is understood?

Capt. COLBETH. That is not quite in line with the policy that the canal company wants to pursue, but that is my policy and I have always done that.

Mr. BLODGETT. You do not want to have any vessel in there while you are not there?

Capt. COLBETH. I have assumed a certain amount of responsibility for the safe passage of vessels, and particularly those of a large tonnage and draft. The only way I feel easy in the passage of ships of that kind is to do it myself. Other men can do it better than I, perhaps, but I prefer to do it my own way.

Mr. BLODGETT. To make that canal efficient for the handling of coastwise trade, what would you say from your experience would have to be done to it?

Capt. COLBETH. Necessarily widened and deepened.

Mr. BLODGETT. How wide and how deep?

Capt. COLBETH. It depends on the type of boat you want to put through.

Mr. BLODGETT. Take our coastwise traffic, the barges and steamers and all.

Capt. COLBETH. You would need a 30-foot canal and then 200 feet wide.

Mr. BLODGETT. And if that were done, in your judgment how much of the coastwise traffic would then use it?

Capt. COLBETH. Probably 95 per cent.

Gen. ABBOT. What would be the deepest draft that would go through that 30-foot canal, in your opinion?

Capt. COLBETH. Twenty-six or twenty-seven feet.

Gen. ABBOT. Everything else would go outside?

Capt. COLBETH. I am speaking of 30 feet at low water. With the highest tide, we could, of course, take 4 feet more. The minimum rise and fall is 4 or 4½ feet at the west end. At the east end we have 10.

Mr. BLODGETT. It is about five in the middle, is it not?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. What do you say as to whether or not that canal should be owned and operated by the canal company or by the Government?

Capt. COLBETH. The Government is in a position to make those improvements, and without doubt no private company is, and the Government undoubtedly has planned to do the dredging, not only to widen and deepen the channel, but to maintain it as it is done, and the Government can do all of that work without the overhead charge that a private corporation has, and the Government could also afford to operate it free of tolls, which is unthinkable from the private standpoint.

Mr. BLODGETT. Has the canal company any plans to do any dredging work to-day?

Capt. COLBETH. No, sir. It is impossible. It can not get the men to do the work.

Mr. BLODGETT. Mr. Scott was one?

Capt. COLBETH. Yes, and the Marine Dredging Co. was another, and the Boston Dredging Co. was another.

Mr. BLODGETT. Have you done any work on dredging during the last six months?

Capt. COLBETH. We have not; no, sir.

Gen. ABBOT. When was the last dredging done at the canal?

Capt. COLBETH. In December, 1917.

Mr. BLODGETT. You have not done any this year at all?

Capt. COLBETH. No, sir.

Mr. BLODGETT. Why haven't you, Captain?

Capt. COLBETH. It has not required it for the amount of traffic we have had.

Col. NEWCOMER. You have had no complaint from navigation interests about the lack of depth?

Capt. COLBETH. No, sir. Navigation interests have been conservative in their policy and they have not asked us to pass deep vessels, and consequently there has been no need for dredging. In addition to that, the Boston-New York steamers which are operating this year are of smaller type than those we have heretofore, and that constitutes the greater amount of our traffic.

Mr. BLODGETT. You have heard Mr. Austin speak of one vessel striking something this year?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. What did she strike? Did she strike on the side or bank or on the bottom?

Capt. COLBETH. She struck the side of the bank, in my opinion.

Mr. BLODGETT. There is no definite way of telling?

Capt. COLBETH. No, sir. I prefer not to be quoted. Anything I say in that line would be a criticism that I do not care to make.

Mr. BLODGETT. Have you had any other accidents by touching the bottom at all this year?

Capt. COLBETH. Not unless it is on the side of the bank; no, sir.

Mr. BLODGETT. Do you say the largest draft is 19 feet that you took through?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. Have you got any word to-day as a direct result of the submarine off of Cape Cod?

Capt. COLBETH. I have a telegram received at 2 p. m., and so far this morning we have had large ocean-going steamers that have never used the canal before passed through successfully, and also one tug with a tow of barges, and the tug Savage which, as a rule, would not operate through the canal. This would apparently be the direct result of the submarine operations off Cape Cod Sunday morning.

Col. NEWCOMER. Do you know whether these steamers were light or loaded?

Mr. BLODGETT. I was just going to ask what the draft was.

Capt. COLBETH. Presumably the Gloucester, of the Merchants & Miners, is loaded and draws 18 feet, and the others I presume are light.

Mr. BLODGETT. That is, none of those were deep draft vessels?

Capt. COLBETH. No, sir.

Mr. BLODGETT. Like a big collier?

Capt. COLBETH. No, sir. Some of them were in the coal trade, but they were returning to the coal ports empty.

Mr. BLODGETT. Is this man who is running the box barges, who has testified here this afternoon—has he served any notice on the company that the canal was in bad shape?

Capt. COLBETH. Not in writing. I think he has said more to-day than I have ever heard him say before about it.

Mr. BLODGETT. You have had no complaints from navigation interests about the condition of the canal?

Capt. COLBETH. No, sir. They take the canal as it is, as a matter of course.

Col. NEWCOMER. I should think if the canal was supposed to be 25 feet and only had a depth of 19 feet, where one wanted to go through, they would ask for the 25 feet?

Capt. COLBETH. We have never been confronted with that question.

Mr. BLODGETT. Advices of that kind would go to the office? They would not come to you, but would go to the New York office?

Capt. COLBETH. Some of it perhaps would. I have had no requests.

Mr. BLODGETT. So far as you know, the people having the deeper draft vessels have not sent them there?

Capt. COLBETH. That is it.

Col. NEWCOMER. Your opinion, and that of the people sharing that opinion with you, that the canal at its worst is better than the outside, is not shared apparently by the seafaring people?

Capt. COLBETH. No, sir, and I can explain that. It is a matter of education.

Col. NEWCOMER. They have not used it?

Capt. COLBETH. That is it. The Hell's Gate Channel of New York is used at all times of the day or night. In fact, I have used it myself at night. That is due to the fact that I was familiar with the route. No stranger would attempt it, even in the daytime, without the aid of a local pilot.

Col. NEWCOMER. It is your policy to encourage those other people to use the canal?

Capt. COLBETH. It is simply a matter of education.

Col. NEWCOMER. In other words, the canal in its present condition you consider capable of handling much more traffic and efficiently than outside?

Capt. COLBETH. Yes, sir, much more. I consider that all of the southbound traffic which is in the coal trade, with the exception of half a dozen steamers, could use the canal to a very decided advantage when those boats are empty. In my opinion it would add materially, perhaps four or five trips, a year to their annual carrying capacity.

Mr. BLODGETT. Is it not a fact that the master of a boat that is accustomed to going one way loaded that he naturally returns the same way light?

Capt. COLBETH. That is true, and there is another factor. The shipmaster is rather a peculiarly constructed man—I am one—and he hesitates, in fact he is very much opposed, to going anywhere where he is not personally acquainted. It sort of affects his pride if he has to take a local pilot at any particular place. That is one reason, I think, that they are backward about using that canal.

Mr. BLODGETT. And going through there, they have to have a local pilot, until they are licensed themselves by the Government?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. About how much of the coastwise traffic do you judge roughly uses that canal now?

Capt. COLBETH. With the coal traffic, there is not over 12 or 13 per cent.

Mr. BLODGETT. How much more could use it light going back if they wanted to?

Capt. COLBETH. Ninety per cent at least.

Mr. BLODGETT. Of the light tonnage could use it?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. If it were made 30 feet deep and 200 feet wide and kept efficiently in such condition, the whole traffic, as I understood you, could use it both ways?

Capt. COLBETH. Yes, sir.

Col. ROESSLER. One or two of the speakers made the statement that about one-half of the revetment was gone. Does your observation bear that out?

Capt. COLBETH. No, sir. It is very much at variance to his judgment.

Col. ROESSLER. You heard that statement?

Capt. COLBETH. I did.

Col. ROESSLER. What is the condition of the revetment?

Capt. COLBETH. A certain amount of the stone protection or riprap has been carried away by erosion, but it is a comparatively small amount.

Col. ROESSLER. In spots here and there?

Capt. COLBETH. Yes, indeed. It is hardly in spots.

Mr. BLODGETT. There is a considerable portion that was never riprapped?

Capt. COLBETH. No, sir; a very small portion.

Mr. BLODGETT. What portion is it?

Capt. COLBETH. At the west end, and there is less current there, and I presume that is the reason it was not considered so necessary to protect it.

Col. ROESSLER. What is the chief difficulty in navigating this canal?

Capt. COLBETH. The fact that it is narrow and has a certain amount of current.

Col. ROESSLER. It is not at any particular locality?

Capt. COLBETH. No, sir. It is through the 8-mile stretch, where the canal is cut through the land.

Gen. ABBOT. Do you have more trouble with your bow or your stern in going through with a favorable tide?

Capt. COLBETH. There is very little trouble experienced with a favorable tide. It is more liable to touch at the stern. A small propeller wheel turning over rapidly can be damaged by striking the riprap, I presume. The turbine engine carries a very small wheel, and it is very susceptible to damage.

Col. NEWCOMER. Are not those small wheels better protected—I mean sheltered more by the bow?

Capt. COLBETH. No, they are not. They are set well out. When you have three screws on a narrow ship, that means that one of the screws must be well toward the outside. That also gives a ship more efficiency in moving. There have been cases where sailing vessels from South America and African ports, as well as from the Gulf and South Atlantic ports, have used the canal going to and from Boston.

Mr. BLODGETT. If the canal were in an efficient state for the depth of vessel or draft of vessel, would any vessel coming from South America naturally use it?

Capt. COLBETH. Yes, they would, for the reason that all of those vessels, particularly the sailing vessels, come up close to the Atlantic coast line to get the benefit of the Gulf Stream. They pass close to Cape Hatteras, and consequently they would save some distance by coming in Buzzards Bay and through the canal.

Col. NEWCOMER. Would not they lose that much by getting out of the Gulf Stream?

Capt. COLBETH. Yes, but they have to get out of it a good deal to get to Boston. The stream is so far from Cape Cod that they would lose it when they were at Nantucket, and at that point, too, the Gulf Stream widens out so that its effect is not so great.

Gen. HAINS. If that canal was widened for 200 feet and deepened to 30, and suppose then that gave an increased velocity of current, would you consider a lock necessary under those circumstances?

Capt. COLBETH. Hardly, but I do not believe it would increase the current.

Gen. HAINS. I was not making any statement about that, but I just supposed.

Capt. COLBETH. It would depend on how much the current would be increased, too.

Gen. HAINS. Say it was increased from one-half to three-quarters of a mile?

Capt. COLBETH. No, sir; a lock would not be necessary.

Mr. BLODGETT. What is the current there now at the highest—the maximum?

Capt. COLBETH. I think there have been times in extreme high tide when we have gales or wind that we have 4 knots.

Mr. BLODGETT. Have you any record of anything over 4 knots?

Capt. COLBETH. We have not. We have not any record of that.

Gen. ABBOT. Can you operate a ship in that current?

Capt. COLBETH. Yes, sir. A full-powered ship operates in any current, and I have operated them myself when the canal has been running its maximum. Loaded barges are not towed against the current to any extent, because it would take a long time to pull them through, and it being a one-way canal it would block the canal for other boats passing through the other way with a favorable current.

Gen. ABBOT. How long does it take for a tow to go through?

Capt. COLBETH. With the slowest-moving tow three hours from Wings Neck to Sandwich, and from the passing point about an hour and three quarters. I would like to state that on last Tuesday, a week ago to-day, the steamer Belfast passed a tug with two loaded box barges in the canal—in the middle of the canal at its narrowest point.

Col. ROESSLER. Both underway?

Capt. COLBETH. No; the tow was stopped, but that simply shows that there is room enough.

Mr. BLODGETT. How much of the canal is 200 feet wide at the bottom now?

Capt. COLBETH. About one-third of it.

Mr. BLODGETT. Do you refer to the 8-mile stretch of the canal proper?

Capt. COLBETH. No, sir.

Mr. BLODGETT. The whole business?

Capt. COLBETH. Through the 8-mile stretch we have 100 feet for a distance of about 5 miles.

Mr. BLODGETT. You have 100 feet?

Capt. COLBETH. Yes, sir; the minimum extends for about 5 miles.

Mr. BLODGETT. And how wide is the balance?

Capt. COLBETH. The balance is 200 and 250.

Mr. BLODGETT. And that is toward the Sandwich end?

Capt. COLBETH. Yes, sir.

Mr. BLODGETT. You have no passing place in the center of the canal?

Capt. COLBETH. We can pass shipping tied up there.

Mr. BLODGETT. You have no dugout place?

Capt. COLBETH. We have no dugout place; no, sir.

Mr. BLODGETT. Is there any place there that would be feasible for making a dugout passing place?

Capt. COLBETH. Almost any part.

Mr. BLODGETT. It could be done feasibly?

Capt. COLBETH. The land is low and the formation is principally sand.

Mr. BLODGETT. What do you say about a tying-up place in the Sandwich end, and would vessels use it for tying up in storms?

Capt. COLBETH. Vessels of the type that use the canal. The last storm we had last spring we had some 27 vessels harbored there, in the harbor that the canal company has made, so to speak, with dolphins. That, of course, can be materially increased by dredging out small basins, but without reference to the canal traffic that harbor at the end of the canal is used to a very great extent by fishing boats, and to that extent the canal has created a harbor which did not exist before.

Col. NEWCOMER. Is there any charge made for boats which simply seek safety there and do not pass through the canal to make use of it as a harbor of refuge?

Capt. COLBETH. No, sir. They lay there as long as they choose, free of charge, and we assess the regular toll when they pass through.

Mr. BLODGETT. But unless they pass through you do not charge them?

CAPT. COLBETH. We may charge them a nominal sum—only 50 cents a day for small boats.

Col. NEWCOMER. I think they said you charged the fishing boats $1?

Capt. COLBETH. That is the larger ones. The majority of them are small and that is 50 cents.

Mr. BLODGETT. About the anchorage off in Cape Cod Bay. What have you to say as to that?

Capt. COLBETH. It is rather an exposed anchorage, but vessels with good chains will ride out the heaviest gale.

Mr. BLODGETT. Have you had experience with that?

Capt. COLBETH. I have; yes, sir.

Col. NEWCOMER. In Buzzards Bay also west or south of Wings Neck?

Capt. COLBETH. Buzzards Bay is a safe harbor almost under any conditions, except for the smallest type of vessels.

Col. NEWCOMER. And they can have permission to put up close to the entrance of the canal behind some of those islands?

Capt. COLBETH. Yes, indeed.

Col. NEWCOMER. So that no anchorage need be dredged there?

Capt. COLBETH. No, sir; not even for the smallest vessels. I might say the smallest barges always come into the canal entrance and tie up to the points provided by the canal company.

Mr. BLODGETT. Some questions have been raised by mariners with reference to the danger of approaching the Sandwich end in stormy weather. What have you to say as to that?

Capt. COLBETH. It could be met by having a fog signal built on the Sandwich breakwater, as of course the entrance to any other harbor should have, and in most cases has, an efficient fog signal. At present we have two bell buoys.

Mr. BLODGETT. Is there a light there?

Capt. COLBETH. There is a light on the breakwater now. I would like to say that, in my navigating a ship for the Eastern Steamship Co. every other night from Boston to New York in 1916 I was not detained.

Mr. BLODGETT. What do you say as to the course through the canal or through the slough?

Capt. COLBETH. In what way?

Mr. BLODGETT. In reference to weather conditions, fogs, and so forth.

Capt. COLBETH. There is very much less fog at the canal, and all of that has been compiled from Government reports and is on file in Washington and at various places.

Mr. BLODGETT. There is much less fog in the canal than in the slough?

Capt. COLBETH. Yes; about half as much.

Mr. BLODGETT. And since you have been operating the canal do you know how they have run with reference to schedule time on the Eastern Steamship Line?

Capt. COLBETH. Yes, sir. They have been very regular.

Mr. BLODGETT. Have they been delayed through the canal on account of fog?

Capt. COLBETH. No. That is another question I can not answer as a master mariner without appearing to criticise.

Mr. BLODGETT. Have you information of them being held up on account of fog?

Capt. COLBETH. The two cases where they were held up were due to the fact that a new captain was in charge, who had not had any experience, particularly in operating through the canal.

Mr. BLODGETT. And only two of those cases?
Capt. COLBETH. Yes, sir.
Mr. BLODGETT. And from your experience, going through the slough, were there many more cases than that? Would they average much more?
Capt. COLBETH. I have known cases down there of 24 hours' delay. They were not infrequent.
Mr. BLODGETT. With reference to the naval forces of the United States and the naval uses, what can you say as to the canal?
Capt. COLBETH. The naval traffic seems to be on the increase.
Mr. BLODGETT. What kind of vessels have been using it?
Capt. COLBETH. Nearly all ships except the largest.
Mr. BLODGETT. And on what draft?
Capt. COLBETH. We have had naval vessels of 19 feet depth. That was the President's yacht, the Mayflower. We have had monitors and small cruisers and a great many destroyers.
Mr. BLODGETT. And that not only shortens their trip, but allows them to go through inside deep water?
Capt. COLBETH. Yes, sir. On Sunday night a naval vessel came through the canal from Newport and landed a certain amount of expolsives, which was taken on an automobile truck from there and carried to Provincetown.
Mr. BLODGETT. Where is the wharf that they stopped at?
Capt. COLBETH. At the east end of the canal. There is a derrick there, too, for hoisting. There are a great many different ways that they get the benefit of navigating through the canal. It is a good place to change the orders of a boat.
Mr. BLODGETT. In your judgment, would private ownership of it make that canal as efficient as Government ownership and operation?
Capt. COLBETH. I should say not; no, sir. Private ownership is always confronted with the necessity of making it pay.
Mr. BLODGETT. At present is there any difficulty in getting dredging machines or work on the canal that you want to do?
Capt. COLBETH. I have not attempted to make any charters this year, but I presume dredges are available.
Mr. BLODGETT. Do you think of anything else you want to say?
Capt. COLBETH. I would like to say, with regard to the entrances to the canal, there is no current, and that is a matter of primary importance in locating the entrance in foggy weather. When a vessel arrives at the entrance of a harbor, she naturally stops or slows down to listen for the sound signals. If the tide is running 3 or 4 miles an hour, as it is in Nantucket Shoals, that requires listening for the sound signals or the master's reckoning, and that is eliminated at both ends of the canal. The current is all inside.
Mr. BLODGETT. So that in your judgment, all that should be done at Sandwich end is to put a fog horn there?
Capt. COLBETH. Yes, sir.
Mr. BLODGETT. Anything to be done at the Wings Neck end?
Capt. COLBETH. No, sir. There it is very well buoyed and lighted.
Mr. BLODGETT. The canal is lighted all the way through?
Capt. COLBETH. Yes, sir. We have post lights opposite each other 500 feet apart, set at the water's edge.
Col. ROESSLER. Do you take vessels through there at night?
Capt. COLBETH. Yes, sir. Boston and New York passenger boats make the passage at night both ways, going and coming, invariably.
Gen. ABBOT. And they go through there at high speed?
Capt. COLBETH. They have to slow down to about 10 miles an hour.
Gen. ABBOT. Faster than the others go?
Capt. COLBETH. Yes, sir.
Col. NEWCOMER. Do any barges go through at night?
Capt. COLBETH. Yes, sir; a great many.
Mr. BLODGETT. In reference to the tonnage that you said would go through if it were made an efficient canal, is there any reason why they could not go through the canal if it were efficient at any time, day or night?
Capt. COLBETH. No.
Mr. BLODGETT. And they could pass each other in the 200 feet width?
Capt. COLBETH. There is a good deal of passage now.
Mr. BLODGETT. If it was 200 feet wide, there would be no trouble whatever?
Capt. COLBETH. No, sir. A tug with a tow could easily pass another tug with another tow.

Mr. BLODGETT. Do they only pass, one overtaking the other, or in opposite directions?

Capt. COLBETH. That is against the rules, and it is very seldom done. It has been done there, but it is inadvisable to do so.

Mr. BLODGETT. It is inadvisable in any narrow channel, is it not?

Capt. COLBETH. It is bound to be.

Mr. BLODGETT. Can you tell me how many fishing vessels used that canal in June?

Capt. COLBETH. We had over a hundred, 109, I think, and there have been days in July when we had 20 fishing vessels in a day, which is due to the fact that they have been catching great quantities of mackerel off of Block Island.

STATEMENT OF MR. CHARLES MAASS, SECRETARY OF THE CAPE COD CANAL CO., NEW YORK CITY.

Mr. BLODGETT. Your name is Charles Maass?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. You are an officer of the Cape Cod Canal Co.?

Mr. MAASS. Secretary of the Cape Cod Canal Co.

Mr. BLODGETT. As secretary of that company, have you the records and books showing what passed through the canal?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. Can you give us the tonnage by years that have used the canal?

Mr. MAASS. Yes, sir; I can. From July 30, 1914, to the end of the year, there passed through the canal 582 vessels and a gross tonnage of 62,787.

In the year 1915 there passed through the canal 2,689 vessels and a gross tonnage of 746,238.

In the year 1916, there passed through the canal 4,635 vessels, and 3,619,833 gross tons, and 938,566 tons of cargo on board what we call crude materials carriers.

In the year 1917, there were 3,330 vessels and a gross tonnage of 2,641,091, and the cargo on board of crude material vessels during that year was 798,657.

Mr. BLODGETT. Can you give us any reason why the tonnage in 1917 was less than in 1916, and the number of vessels considerably less?

Mr. MAASS. On account of the steamer Bay Port sinking in the canal in December, 1917, the Eastern Steamship Co. steamers of 4,779 tons each discontinued running.

Mr. BLODGETT. What date did you say the Bay Port sank?

Mr. MAASS. December, 1916.

Mr. BLODGETT. You said December, 1917, and I wanted that correct. Go on to the year 1918.

Mr. MAASS. The year 1918, up to June 30, there were 1,493 vessels, a gross tonnage of 945,981, and the cargo on board crude material vessels 462,521.

The total number of vessels for the time of July 30, 1914, to June 30, 1918, was 12,729 vessels, 8,015,980 gross tons, and 2,199,744 tons of cargo.

Mr. BLODGETT. That actually passed through the canal?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. Have you got any figures showing what has passed since—that is, up to June 30 last?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. Have you made any figures to show what the total tonnage was to New England during any of those times?

Mr. MAASS. No, sir.

Mr. BLODGETT. You have some prints showing the ups and downs of the canal?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. Is that it [indicating]?

Mr. MAASS. Yes, sir; that is it.

Mr. BLODGETT. Will you please tell me what this print that is before you represents?

Mr. MAASS. This print represents the total gross and cargo tonnage.

Mr. BLODGETT. I see here at various points peaks running up. What do those represent?

Mr. MAASS. The high peaks represent the gross amount of tonnage in any one month.

Mr. BLODGETT. Here is a very distinct drop from November, 1916, to January and February, 1917. Is that what you spoke of by the Bay Port accident?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. Why did that cut off the total in that way?

Mr. MAASS. By the Eastern Steamship Co. discontinuing.

Mr. BLODGETT. Did any other vessels also discontinue using the canal?

Mr. MAASS. Yes, sir; they did.

Mr. BLODGETT. And then it began again to come up and reached its peak in July, 1917?

Mr. MAASS. In August, 1917.

Mr. BLODGETT. And then in September it began to go down and went down to nearly low-water mark?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. What caused that?

Mr. MAASS. By the steamers Bunker Hill and Massachusetts being taken over by the Government.

Mr. BLODGETT. Was that the only cause of it?

Mr. MAASS. Also the ice conditions.

Mr. BLODGETT. And now since March it has gone steadily up until it has arrived back at about 350,000 tons?

Mr. MAASS. 366,000 tons.

Col. NEWCOMER. What does that mean? The standard here is the tonnage per month?

Mr. MAASS. No. That is a scale going up.

Col. NEWCOMER. But what time? A scale for what time? That represents 270,000 tons for what time?

Mr. MAASS. These are just numbers so as to match over here [indicating]. This will show 360,000 tons in that line [indicating].

Col. NEWCOMER. For what time?

Mr. MAASS. In the month of May.

Col. NEWCOMER. This second line below there—what is that?

Mr. MAASS. That is the cargo on board of crude material carriers.

Mr. BLODGETT. I think perhaps that is very interesting for you to glance at, if you will.

(The prints referred to were here explained in detail to the board.)

Col. NEWCOMER. You have no method of telling the cargo carried with reference to gross tonnage?

Mr. MAASS. No, sir, not on the passenger steamers. It is just the crude, coal, and lumber and stone and things like that.

Gen. HAINS. And you do not include anything on the passenger steamers?

Mr. MAASS. No, sir.

Col. NEWCOMER. Just give the gross tonnage?

Mr. MAASS. Just give the gross tonnage. The next one is the yachts. The next is the regular passenger steamers, and freight steamers, tugs, and barges.

Col. NEWCOMER. Those are all included in the other?

Mr. MAASS. Yes, sir; and these are subdivided.

Mr. BLODGETT. This is compiled from what?

Mr. MAASS. From our monthly reports.

Mr. BLODGETT. From your monthly reports. I would like to offer these and leave them with you gentlemen. I think it might be helpful to you.

Mr. Maass, have you ever made any figures to show what portion of the cargo went through the canal that went to New England?

Mr. MAASS. Not any particular commodity, but by tonnage we did.

Mr. BLODGETT. Will you give me the figures that you made on that?

Mr. MAASS. In 1909, almost immediately after the construction of the Cape Cod Canal began, the company had two reports, one made by Messrs. Ribbs and Cartell and the other by C. S. Sims. The Ribbs and Cartell report had a tonnage passing around the cape of approximately 16,000,000. The C. S. Sims's report in 1906 showed 28,000,000.

Col. NEWCOMER. Were these tonnages registered gross tonnage or cargo?

Mr. MAASS. Gross tons. In 1909 we determined to find out the number of vessels which actually passed around Cape Cod. We therefore wrote to Lieut. Col. J. C. Sanford at Newport, asking him if he had a record of the number of vessels which passed around Cape Cod. On December 27, 1909, Lieut. Col. Sanford, of the Engineer Corps writes—shall I read the letter?

Mr. BLODGETT. Yes.

Mr. MAASS (reading):

"In reply to your letter of the 23d instant, in regard to the information which Capt. Cutler had kindly given me regarding the number of vessels passing around Cape Cod, I inclose a copy of his letter dated October 2, 1909, sending me the record, so that you may see how it was made up. The record consists of 24 sheets giving the vessels passing each day. For the purpose of making the preliminary examination report on the proposed improvement of Nantucket Shoals for which the information had been furnished to me, I made a summation of these, and send you inclosed a copy

of the summation for each of the light vessels. The records did not state whether or not the numbers covered all vessels passing during the 24 hours.

"I therefore wrote to Capt. Cutler in regard to this, who stated that the figures were intended to embrace all vessels passing during the 24 hours. He adds: 'The night passing, however, is not nearly so accurate as the day passing.' He also explains the meaning of the word 'tows' as follows: 'It is my understanding that when the word 'tows' is used in enumerating the vessels that pass a light vessel, the towing vessel is down under the head of 'steamers' and each of the objects towed is down under the head of 'barges.' I will send you a copy of my preliminary examination report as soon as printed, which ought to be soon. The report contains a rather lengthy discussion, as required by department instructions, regarding the amount of commerce affected by the proposed improvement, and you will probably find in it some data that will be of interest to you.

"As to the tonnage, I could get no record of the tonnage of the vessels or of the cargo tonnage. I, however, attempted to estimate the freight tonnage roughly from statistics of Boston Hardor and for the other harbors above Cape Cod under improvement by the Government, taking the statistics from the annual report. The coal tonnage of these ports was quite fully given in the annual reports and the summation for the calendar year 1907 was 9,812,911 short tons. For other freight, I could get no reliable totals from the annual reports, and took Mr. Parsons's estimate of 6,000,000 tons."

Immediately after receipt of this letter, we began to write to the different carriers of crude materials and try to ascertain the tonnage. We had the number of vessels given in a letter from W. G. Cutler, captain, United States, inspector, second district:

"Inclosed is a record of vessels passing Pollock Rip Shoals and Great Round Shoal light vessels from August, 1908, to August, 1909, with the exception of the record for October, 1908, in the case of Pollock Rip Shoals Light Vessel, for which month the record of Shovelfull Shoal Light Vessel is substituted, as vessels passing this ship must necessarily pass the other.

"When through with these papers please return them."

And then statements are attached showing that vessels passing Great Round Shoals for the time mentioned in the letter was as follows: Steamers, 219; sailing vessels, 1,695; tows, 135; and total vessels, 2,049.

And the vessels passing Pollock Rip Shoals Lightship for the time mentioned: Steamers, 6,710; sailing vessels, 7,212; and tows, 6,870, a total of 20,792.

This gave the company some information to try to find the number of tons represented by the number of vessels, and in about 1910 we started to compile a record of the commodities taken by the different lines by writing the individual shippers. We got this tonnage up to 14,500,000 and stopped, and from that time on we kept adding to the figures here and there, but we did not get very much of a successful result.

In 1916, after the canal was opened we knew the total that passed through the canal. We knew the number of vessels, we knew the number of gross tons, and the cargo tons, but we did not know what went around the cape. We therefore fine-combed the coast to find out if any such record was tabulated. We went to the marine reports for the Herald and for other papers in Vineyard Haven, and found that while the record there was kept daily, nothing was ever tabulated from day to show a true record. We then tried various points around Cape Cod, but had no results. The only alternative we had was to take the New York Herald, which quoted every morning the arrival and departure of vessels at Vineyard Haven and the passing of vessels at Nobska, Chatham and Highland Light, and at Boston, the vessels which arrived and departed at those places, and we took special care to see that when a ship was once reported as passing or arriving or departing from any one of these places mentioned, that it was not tabulated the next day or for several days afterwards. We kept a daily record of that for the months of May, June and July of 1916—this is the original tabulated record.

Col. NEWCOMER. We have a copy of that in the record already.

Mr. MAASS. Yes, sir; and for the months of December, January, and February. For the months of May, June, and July there passed around Cape Cod 3,954 vessels and an estimated gross tonnage or cargo tonnage of 4,106,290, and for the months of December, 1916, January, 1917, and February, 1917, there passed around Cape Cod 3,477,709 tons and 2,808 vessels, or, for the six months, 7,583,999 tons and 6,762 vessels. By doubling these figures to give the record for a year, the number of vessels passing around Cape Cod is 13,524 vessels, and the cargo or gross tonnage is 15,167,998 tons, and by adding the number of vessels which actually passed through the canal for the year 1916 shows 4,635 vessels and the gross tonnage is 3,619,883 tons, or a total number of vessels which passed through the canal and around Cape Cod for the year 1916, of 18,159 vessels and a gross or cargo tonnage of 18,787,881.

Of the 6,762 vessels passing around Cape Cod for six months, there is not shown the gross tonnage of 126 steamers, 48 schooners, 23 barges, and 5 tugs, as the vessels are either foreign or do not show in the Government books.

In the figures given of vessels passing through the canal, the number of yachts, motor boats, and Government vessels are included, and their gross tonnage, but not the number or gross tonnage of tugs towing vessels through the canal, and in the figures for the vessels passing around Cape Cod only commercial vessels are shown. The number and gross tonnage of Government vessels, yachts, motor boats, and tugs towing vessels is not shown.

A total of 18,787,881 tons per annum is shown, which represents only the tonnage of those vessels which have passed through the canal, or reported in the various stations under shipping news of the New York Herald as going around Cape Cod. Not included in these figures there would be an additional number of tugs and their gross tonnage as passing through the Cape Cod Canal, and also the gross tonnage o tugs towing vessels around Cape Cod, yachts, and Government vessels, all of which would easily aggregate 4,000 vessels and 6,500,000 tons, making the total number of vessels passing through the canal and around Cape Cod as 22,159, and the tonnage as 25,287,881.

In the letter from Capt. W. G. Cutler, of the United States Navy, inspector of the second district, it will be seen that 22,841 vessels were reported as passing the Great Round Shoals Lightship and Pollock Shoals Lightship, that Capt. Cutler states that the number of vessels passing in the daytime is accurate, but that the number passing at night is not so accurate, leaving the impression that there were vessels which passed during the night of which no record was kept.

This, so far as I know, is the only record in existence of the number of vessels passing around Cape Cod in a year.

Mr. BLODGETT. Mr. Maass, can you tell us anything about how much more traffic would be obtained if that canal was deepened to 30 feet and widened to 200 feet?

Mr. MAASS. I think that practically all the tonnage that now goes around the cape would use the canal. I have talked with many masters during my association with the canal company, perhaps hundreds of them, and it seems to me to be a matter of prejudice on the part of the masters. In talking with Capt. Cherry, superintendent of floating equipment of the Lehigh Valley, who lost his tug by a submarine, I asked him "Why don't you use the canal?" He said, "I will use it. I like the canal, but I can not get my men to do it," and that practically expresses the opinion of a great many men I talked to regarding the canal.

When once a man does use the canal, he swears by it. I have known of Capt. Haskell, of the yacht Mohicon, coming into the office and applying for toll rates, and after giving the rates to him, he said, "I will use the canal going east." He used it, and on his return trip came into the office and said, "I don't think much of that canal." I said, "Try it again." After his fifth trip, he has told me that the owner of that yacht would have to get a new master if he was ordered around the cape. It is simply a matter of educating these marine people up to a new waterway. They have for years used the Vineyard Sound route, and it is pretty hard to educate them to something new.

Mr. BLODGETT. Have you any other facts which you have compiled or can give us? I do not want to duplicate anything, if you were present at the first hearing, but I do not know that you were.

Mr. MAASS. No. I might make a statement regarding the number of yachts, which decreased on account of the war.

In 1916 we had 945 yachts through the canal, with a gross tonnage of 80,049, and receipts from tolls of $25,828.54.

During the year 1917 we had 354 yachts, 15,609 gross tons, and receipts of $6,689.

And for the half year of 1918, 45 yachts, 912 gross tons, and receipts of $608.

Mr. BLODGETT. After the Bay Port accident, did the canal company pass a rule declining to allow vessels of the whaleback type to use the canal?

Mr. MAASS. Yes, sir; we did.

Mr. BLODGETT. That was on account of that accident?

Mr. MAASS. Yes, sir.

Mr. BLODGETT. And since then none of these vessels have used it except light?

Mr. MAASS. No, sir.

Mr. BLODGETT. The Devereux was one of those vessels?

Mr. MAASS. Yes, sir. In January of this year we lowered rates from 5 to 4 cents on cargo and 3 to 2 cents when the vessel was light. We did that in the interests of the coal trade, as New England needed the coal, and lifted the ban on those lake ships with which we had so much trouble in previous years, so now the steamers of this type go through.

Mr. BLODGETT. Do any of them go through loaded now?
Mr. MAASS. No, sir.
Mr. BLODGETT. Only light?
Mr. MAASS. Yes, sir.
Mr. BLODGETT. Something was said about complaints being made by owners of vessels as to the depth of water. Have you received any complaints at your office in the last year or two?
Mr. MAASS. Yes; several shippers have told me that we had shoals in the canal, which was so.
Mr. BLODGETT. Which was so?
Mr. MAASS. Which was so, yes, sir; but none of these accidents to my mind was attributable to shoals. I think the vessels struck the side of the bank.
Mr. BLODGETT. But there were shoals there, and there are shoals there to-day?
Mr. MAASS. There are shoals there to-day; yes, sir. One man told me within the last few weeks that his vessel struck and did some damage to a barge drawing 4 feet of water. He swears there was a shoal in the canal.
Mr. BLODGETT. Apparently it must have been on the bank?
Mr. MAASS. Over the bank.
Mr. BLODGETT. Or else he must have been on the bottom?
Mr. MAASS. Yes, sir.
Mr. BLODGETT. Your company has not done any work this year, has it?
Mr. MAASS. No, sir; for the reason that we could not obtain a dredge.
Mr. BLODGETT. Do you know about that?
Mr. MAASS. Yes, sir; I know that positively—that we can not obtain a dredge at the present time.
Mr. BLODGETT. Have you tried to obtain a dredge?
Mr. MAASS. I spoke to Mr. Wright, of the Railroad Administration's office, who was at the cape several weeks ago, about these shoals, and asked him if he knew where we could obtain a dredge, and he said "You can not obtain a dredge in these days."
Mr. BLODGETT. Is the Government using the dredges?
Mr. MAASS. Yes, sir; and that also applies to the dolphin work which we did in the month of May. We chartered a pile driver to drive some dolphins, and the work was scarcely begun when the Government took this pile driver away, with the statement that they had other use for it.
Mr. BLODGETT. Have those facts hampered you in your operation of the canal this year?
Mr. MAASS. Yes, sir.
Col. NEWCOMER. Have you consulted with anybody else besides Mr. Wright about the practicability of getting dredges?
Mr. MAASS. I happen to know in an off-handed way that they could not be obtained. Friends of mine in the shipping business needing dredging equipment have told me that they could not get any; that dredges were at a premium.
Col. NEWCOMER. There is no question about them being more or less at a premium, getting higher rates; but it is practicable to get dredges in cases of emergency.
Mr. BLODGETT. Mr. Maass, is there anything else that you have in mind to say?
Mr. MAASS. I would like to submit to the board some photographs which we had taken by our photographer at Buzzard's Bay. I asked him to make up a set of the photographs of the largest vessels which have used the canal. I would like to submit those photographs to the board. There is a description on the back of each one as to what they are, and a very noticeable photograph was the one of the Perth Amboy, which was torpedoed and sunk by this submarine.
Mr. BLODGETT. That covers everything, Mr. Maass. One question I will ask you, whether in your opinion the Government should take this canal and own it and operate it or not?
Mr. MAASS. I think the Government should take it, own it, and operate it.
Mr. BLODGETT. And in your judgment, state whether or not that is the best thing to be done.
Mr. MAASS. I think the public can best be served by so doing.
Mr. BLODGETT. I would like to ask Mr. Wilson one question to-night, if it is all right, and then if you are willing, I would like to adjourn until to-morrow.

STATEMENT OF MR. H. P. WILSON, VICE PRESIDENT OF THE CAPE COD CANAL CO., NEW YORK CITY.

Mr. BLODGETT. Mr. Wilson, the question has been raised about your doing dredge work on the canal this year—your not having done it. Will you please tell us about that?
Mr. WILSON. I was interested in Mr. Colbeth's testimony as to complaints regarding shoals in the canal. They would come to the office and would not ordinarily reach

Mr. Colbeth. Vessels present themselves to the canal knowing what the canal is, and nearly all applications for passage by new companies and by new vessels through the canal come to the office. Our advertising is done through the office and our circularization is done through the office, and business is sought through the office.

We have had a good deal of complaint about the canal. Mr. Hughs complained quite bitterly, and the Eastern Steamship Co. has complained repeatedly. We are now making an investigation as to just what happened in the canal the other night when they tore up that wheel. We have not done any dredging this year, because we have been unable to get the equipment. If the board would be interested, I can have Mr. Furst here to-morrow morning, because he reported to me that it was impossible to secure the class of equipment which was necessary for us to have to dredge out that canal. He reported to me a week ago that he could not obtain it at any price. There is a Government dredge, so he tells me, available at New London.

You remember last year, Col. Newcomer, we made application for the use of that dredge, and we hoped to have the use of it, when some complaint was made, and Mr. Furst this year says that same character of complaint would have been made, but prior to our taking the matter up, in order to see if we could not secure some Government equipment, we have been searching the entire country for it, and he reports to me it is impossible to obtain the equipment and get it for us to dredge out 40,000 yards out of the canal.

Col. Newcomer. And Mr. Furst suggested that there is a Government dredge at New London that might be used?

Mr. Wilson. Yes.

Col. Newcomer. I am rather surprised at his lack of familiarity with conditions in that respect. That same dredge is now in New York City.

Mr. Wilson. He said he was under the impression that that dredge was available, and that that was the class of dredge we needed.

Col. Newcomer. I understand that there was a dredge in Portland Harbor that would be available in the course of a week or so.

Mr. Wilson. I do not know what class of dredge it is.

Col. Newcomer. It is the Kennebec.

Mr. Wilson. Is it a self-contained suction dredge?

Col. Newcomer. It is a pipe line dredge.

Capt. Colbeth. The Kennebec is a bucket dredge. We have had it. A suction dredge of the first class is the Federal.

Col. Newcomer. I have just heard of this through somebody else, and I understood them to say that it was a hydraulic dredge up at Portland, Me., that could be used.

Mr. Wilson. I simply want to say that we have used every reasonable means to secure apparatus to dredge out this canal, without success.

Col. Newcomer. It is hard to get them, but I do not think it would be impossible.

Mr. Wilson. He has told me himself within a week.

Gen. Hains. What part of the canal do you want to use the dredge on?

Mr. Wilson. I will point it out on your chart.

Mr. Blodgett. Mark it with a black pencil.

(The point was so marked.)

Mr. Maass. I can give you the exact amounts.

Gen. Hains. That is not necessary.

Mr. Maass. There is a small one there [indicating] of 4,000 yards.

Col. Newcomer. That is about Sagamore Bridge?

Mr. Maass. About Sagamore Bridge, and then there is one right in here [indicating], principally on the south side of the channel.

Col. Newcomer. The principal shoals, then, are at the entrances?

Mr. Maass. At both entrances, but they have shoaled up very rapidly. The Sagamore Bridge shoal is the one that requires attention.

Mr. Wilson. What Mr. Furst said was that the type of equipment necessary to do that work was not available, and that he had also reported to the Railroad Administration. We have tried to do the best we can by our customers. These two companies complained very bitterly.

Col. Newcomer. I do not see why they complained.

Mr. Wilson. We hope to know more about this complaint when we know more about what happened there the other night.

Col. Newcomer. They evidently got over on the bank.

Mr. Wilson. Of course, one of the causes of complaint is the lack of dolphins. Complaints are twofold. One is as to lack of depth, and the other is the condition of the dolphins.

Mr. Blodgett. A master goes in there, and if he is not very careful he is going to have trouble.

Col. NEWCOMER. Have you had any complaints at the office about the lack of width?

Mr. WILSON. Yes, sir; we have had complaints about the lack of width, also about our mooring dolphins and our aids to navigation. We do not want this board to get the impression that we have not done everything we consistently could to serve our customers in that canal. We have done so and made every possible effort. Until 1918 we had no difficulty. We had it pretty well dredged. We had dredges in there last December, and it has been impossible for us to get piles driven, and we have piles on the ground there at the present time which we can not have driven. Mr. Scott used to do our work. Mr. Scott has not any equipment at the present time that he can let us have. It is impossible to get any contractor to take that sort of work. You simply can not have it done.

Mr. BLODGETT. Mr. Scott's equipment is working for the Government?

Mr. WILSON. I understand so.

Gen. ABBOT. In other words, you want to go on record as not concurring in what has been said as to the canal company's leaving things just as they were and not keeping it up or maintaining it?

Mr. WILSON. I do; yes, sir; emphatically.

Mr. BLODGETT. That is, you have not kept it up because you could not?

Mr. WILSON. The canal company has done everything in its power. It has been through no lack of inclination; neither have we attempted to save money at the expense of our customers in the canal.

Col. NEWCOMER. Do you know of any way in which the United States could have kept it up any better than you have?

Mr. WILSON. My observation has been that the United States does things on a little more comprehensive scale than private capital does. I think the United States could have done it. I have great confidence in the ability of the United States to do whatever it attempts.

Mr. BLODGETT. A newspaper man has just informed me that the President has issued a proclamation permitting the Railroad Administration to take over and operate the canal.

Mr. WILSON. I think you will find that question of yours now will be answered. The Railroad Administration will operate that canal, and I think you will have an excellent administration.

Col. NEWCOMER. If the canal company had asked the assistance of the Federal Government to get the necessary plans, and the Federal Government had felt that the situation justified giving this priority over other places, they could have done that; of course, that is through the Federal Government.

Mr. WILSON. I respectfully submit, Colonel, our best efforts in that regard. We asked for a dredge and you said we could have it. We have contemplated coming to you, and will come to you, if these rumors that we hear prove untrue—we will make application to get a dredge. We have been waiting to ascertain if we could not get it elsewhere. It is only within a week that Mr. Furst has told me that I could not have the thing done privately, because the equipment was not available.

Mr. BLODGETT. I think, if you are willing to adjourn until to-morrow morning, I can shorten the rest of the hearing very much by conferring with Mr. Wilson and Mr. Coakley with regard to the testimony we will want to offer.

Gen. HAINS. All right. We will adjourn now until 9 o'clock to-morrow morning.

(Whereupon, at 4.45 o'clock p. m., an adjournment was taken until to-morrow, Wednesday, July 24, 1918, at 9 o'clock a. m.)

SECOND DAY.

WASHINGTON, D. C., *July 24, 1918.*

The hearing was resumed at 9 o'clock a. m., pursuant to adjournment.

Gen. HAINS. The board will come to order.

Mr. BLODGETT. I would like to call Mr. Coakley.

STATEMENT OF MR. COAKLEY, TREASURER OF THE CAPE COD CANAL CO., NEW YORK CITY.

Mr. BLODGETT. You have some records that you want to bring down to date, with reference to the vessels passing through the canal?

Mr. COAKLEY. Gentlemen, with your permission, I will submit statements which will bring down the records to the present time, the figures of which have already been supplied.

Gen. HAINS. All right.

Mr. COAKLEY. We have heretofore filed the gross tonnage and the earnings up to August 31, 1917. This brings it down to June 30, 1918.

Mr. BLODGETT. Will you give the gross figures, so that the stenographer can put them in the record?

Mr. COAKLEY. This shows that the gross earnings for the year ending June 30, 1915, were $32,898.66; for the year ending June 30, 1916, $120,608.42; for the year ending June 30, 1917, $240,601.14; and for the year ending June 30, 1918, $219,816.28.

I might state that the percentage figures to the right of each of the quarterly periods in these statements represent the increase or decrease by quarters of the traffic and the earnings. Also, at the bottom of each year, it gives the percentage of increase or decrease over the previous year.

The tonnage figures have been submitted to you by months. This gives it by quarters and the totals for each year, showing that for the year ending June 30, 1915, 196,355 tons; for the year ending June 30, 1916, 1,772,157 tons; for the year ending June 30, 1917, 3,289,061 tons, and for the year ending June 30, 1918, 2,758,427 tons. It is marked "Gross tonnage." At the bottom of it is a short explanatory note, explaining in general just what decreases are represented, and for the record I will read that:

"Steady increase of earnings and tonnage is shown until the quarter ending March 31, 1917. The exceptional decrease reported was due to the blockade of the canal by the wreck of the steamer Bay Port, which sank December 13, 1916, obstructing traffic almost entirely until the early part of March, 1917. The decreases for the quarter ending December 31, 1917, were due to the taking over for war purposes by the United States Government of the two large passenger and freight vessels Massachusetts and Bunker Hill, which had been running daily trips through canal. The decrease in the following quarter was on account of the freezing over of the channel in Buzzards Bay, due to the exceptional severity of the weather."

I would also like to submit for the completion of the record, if you will approve, the figures showing operating expenses, including maintenance, from April 10, 1916, to June 30, 1918. You have had the figures from April 10, 1916, to August 31, 1917. This brings it in two parallel columns, the first column showing 16⅔ months from April 30, 1916, to August 31, 1917, and the second column showing the 10 months from September 1, 1917, to June 30, 1918. The final column shows the last full month of operation, that of June, 1918. It gives the monthly average for the first period of 16⅔ months as $24,425.96. That includes all operation of the different component parts of the canal, separated and segregated here under the various headings, the administration expenses at the Cape, including salaries of superintendent and staff and all his office expenses, and the general administration of the company in New York, including all fiscal expenses and legal fees and retainers and everything that could be embodied.

Col. ROESSLER. Interest on bonds?

Mr. COAKLEY. No. Taxes, insurance, accidents, damages, anything that we had to pay to charge against the earnings, outside of interest on our bonds. That is all but interest on bonds. The second period of 10 months shows a monthly average of $18,522.04, and the final month separated by itself is $13,259.32.

Gen. HAINS. Is this in duplicate?

Mr. COAKLEY. Yes, sir; that is in addition.

Gen. HAINS. I say, is this in duplicate?

Mr. COAKLEY. Those are carbon duplicates.

Mr. BLODGETT. You have left two copies?

Mr. COAKLEY. I can leave the three, if you desire.

Mr. BLODGETT. Now, Mr. Coakley, in reference to the copy of the testimony at the first hearing, there were some errors that you want to correct?

Mr. COAKLEY. If the board will permit me, I would like to make some slight corrections in the stenographic report of the hearing which was held on April 23, 1918.

Mr. BLODGETT. For the stenographer, give the page.

Mr. COAKLEY. On page 12, line 3, the word "now" should be "not." On page 15, line 4, it should be "Cape Cod Construction Co." instead of "Cape Construction Co." On page 15, line 13, it should be "Thomas L. Livermore" instead of "James L. Livermore." Page 22, line 12, "announcement" should be "commencement." On page 26, line 9, "common" should be "nominal." On page 35, line 2, the word "tow" should be "toll." On page 72, line 10, "Mr. Coakley" should read "Mr. Wilson." It was a statement of Mr. Wilson and not of mine. On page 28, line 9, I would like to insert four words to make the context. The statement reads a little bit too extravagant, and I do not recall having made it in that sense. I am afraid the stenographer did not catch three or four words. It should read "So that 80 per cent of the coal going to New England to-day that can do so goes through the canal." Insert the words "that can do so." That would make the record complete.[1]

[1] Above corrections made in hearing of April 23, 1918.

Gen. HAINS. There is no objection to his making those corrections.

Mr. BLODGETT. Now, Mr. Coakley, you are an officer of the canal company?

Mr. COAKLEY. I am the treasurer of the company.

Mr. BLODGETT. What have you to say with reference to whether or not the canal should be taken over by the Government and properly equipped and kept equipped and used by the Government for the public, or whether it should remain under private ownership?

Mr COAKLEY. My personal opinion, and I can give that without any prejudice to my opinion as an official of the canal company, I feel that all waterways should belong to and should be operated by the Government. In our Government waters the jurisdiction over all navigable streams is in Government hands, and I feel convinced that it is for the greater good of the greater number—in fact, the whole country would be benefited if the canal itself and other intercoastal waterways were made toll free, so that the commerce of the coast could use them to the fullest extent possible, and thereby reduce very materially the cost of transportation. There is no difference of opinion amongst clear-thinking men, I believe, that the cost of transportation enters very seriously into the cost of production, and thereby into the cost of consumption. Anything that will reduce the cost of transportation will reduce the cost of consumption, and as an individual consumer I am very much interested in that phase of the situation.

Mr. BLODGETT. What can you say with reference to the amount of proportionate coastal tonnage if the canal were made efficient for tonnage of the depth required?

Mr. COAKLEY. From my experience and connection with the canal enterprise, and from personal contact with a large number of seafaring men who are in the coastwise service, I can say unqualifiedly from what I have heard, from what I have studied, and from what I know that in my opinion if the canal were widened to 200 feet and made deep enough to accommodate all of the coastwise traffic, that practically all, if not every ton, of shipping would use the canal

Mr. BLODGETT. What depth would that require?

Mr. COAKLEY. The largest colliers to-day require a 30 to 33 foot depth. Thirty-five feet would probably be safer for the coastwise traffic that may develop in the next few years, but 30 feet to-day would be the minimum to accommodate all coastwise traffic. It is a personal recollection of mine, distinctly I recall an officer in one of the coastwise liners who said if there was a navigator on the coast that ever went around Cape Cod without some sinking of the heart he did not know of him; he was never sure of the final outcome of his trip.

Mr. BLODGETT. Is there anything more you wish to add?

Mr. COAKLEY. There is nothing more that I know of.

Mr. BLODGETT. That is all, unless there are some questions.

Col. NEWCOMER. One moment, Mr. Coakley. I was going to ask you this: There is a statement that you submitted to the Inland Waterways Committee showing the gross expense, apparently about $159,000, for the period from September 1 to May 31, in which you add $44,000 for maintenance, cost of the canal, and then operating expenses, including all overhead, of $114,000?

Mr. COAKLEY. All of these figures are included. Of course they are not segregated in that respect.

Col. NEWCOMER. These are larger somewhat, because you have one month——

Mr. COAKLEY (interposing). They are a part of this figure $185,000. I carried this to June 30, and this to May.

Col. NEWCOMER. All of the expenses included there are here, except there is one month additional?

Mr. COAKLEY. Exactly. There might be one comment on the maintenance figures there, especially with regard to dredging of the canal prism. In these figures the cost or actual outlay of the company for dredging since the canal was opened for traffic is included. You will see in the last 10 months we have spent twenty-five thousand odd dollars for dredging the canal. That may be disputed as correct bookkeeping, to charge all of the back costs to the past earnings. In my opinion more correct accounting would allow that when you dredge the canal, costs should be carried against future earnings instead of past earnings, because if you prepare the prism to coming traffic and not for past traffic, an allowance or amortization of the cost as it actually is incurred should be written off each month. I would say approximately $3,000 to $3,500 a month. According to our experience the actual monthly cost of maintaining the canal prism is around that figure. In those statements the cost is all shown against the past earnings, whereas in my opinion it is for the benefit of the future traffic that might come when you dredge the canal.

Gen. ABBOT. It was caused in the past, but it is done for the future?

Mr. COAKLEY. Exactly. There is a very fine line to be drawn, and I think the accounting in either way would be justified. If I would do it over again I would spread it over the future traffic instead of the past traffic.

Col. NEWCOMER. I notice that one railroad bridge cost as much for maintenance as the two highway bridges?

Mr. COAKLEY. Exactly.

Col. NEWCOMER. What is the reason for that?

Mr. COAKLEY. The reason is that the railroad bridge is a much heavier type of structure.

Col. NEWCOMER. Is not this simply operating expense? I mean the paying of employees?

Mr. COAKLEY. And supplies and oil.

Col. NEWCOMER. Do you have to maintain the apparatus in the signal tower?

Mr. COAKLEY. Exactly, and I will tell you what is included also. The wages of the two crossing men employed at the Gray Gables crossing, which is somewhat east—well, I have not made a special item of that, but there are two watchmen who are on the grade crossing at Gray Gables bridge. It is considered a part of that, and that is one reason why that appears heavier, but the two highway bridges are much more economically maintained. They do not require the very heavy outlays for repairs, and the railroad bridge has to be raised for everything that comes through.

Col. NEWCOMER. Yes, and the highway bridges, of course, do not?

Mr. COAKLEY. The highway bridges are 30 feet over high water. There are certain types of boats that go through without opening the bridge.

Col. NEWCOMER. Did you bring along a statement showing the traffic down to date? I understood you were going to submit a statement of that kind, like your daily account?

Mr. COAKLEY. I brought with me my own personal memoranda, which shows for the month of July up to the 20th of the month we had 326 vessels through the canal, and that gross earnings for the 20 days were $18,320.29.

Mr. BLODGETT. That is July?

Mr. COAKLEY. Up to July 20, the day I left, the last reports I received. There had been 326 vessels which went through the canal and the gross earnings were $18,320.29, which would indicate an average of 16 vessels a day, with earnings of $916 a day. From these figures you will see that the average daily operating expense, including all taxes, insurance, damages, and all that, is approximately $440 a day.

Col. NEWCOMER. What I was referring to was that statement where you give the traffic for the day, then the traffic of the current month up to date and then the traffic for the year up to date—the three statements, you recall those traffic sheets, do you not?

Mr. COAKLEY. Oh, I know what you mean.

Col. NEWCOMER. You submitted them for every month?

Mr. COAKLEY. This happens to be the last day that we received reports. This is what the colonel is referring to. This traffic for July 20, 1918, for the day, we had 35 vessels through the canal. That was last Saturday, 17,206 gross tons, having on board 10,449 cargo tons. The earnings for the day were $1,448.66. That was traffic going east and west. This is the eastbound traffic and this the westbound traffic [indicating on statement]. It consisted of two steamers, the Hampden with two trips. Each of these passenger boats make two trips through the canal every other day. The freight steamer H. F. Dimick, these vessels belong to the Eastern Steamship Corporation. There were two yachts; there were three passenger and freight boats, 1 empty passenger and freight boat, 4 empty barges, 1 empty schooner, 8 loaded barges, 12 fishing boats, and 4 Government boats—a total of 35 vessels last Saturday.

Col. NEWCOMER. That is an unusual number of vessels. You are averaging about 15 or 16 or 17 a day, and this day 35. That profile record will show exactly how many boats passed through each month, and when I was up at the canal last week I understood them to say that they were going to send down one of these, bringing the traffic down to date, and then total for each month, and then the total for the year.

Mr. WILSON. We will get that to you by Friday morning, Colonel.

Mr. COAKLEY. I believe the greatest number of boats that ever passed through the canal in any one day—of course this is no criterion, because there were a lot of yachts—but there were 107 boats in one day that passed through the canal. That happened to be the occasion when the fleet of the New York Yacht Club passed through. That was shortly after the canal was opened in 1916.

STATEMENT OF MR. H. P. WILSON, VICE PRESIDENT OF THE CAPE COD CANAL CO., NEW YORK CITY—continued.

Mr. WILSON. I am going to take about 10 minutes of your time, gentlemen. First of all, Mr. Belmont is lying in a hospital in New York, just having had a serious operation, and has requested me to make his respects to you and to say to you that he regrets

exceedingly that he is unable to attend here in person. He also asked me to correct a false impression he evidently made upon you at the time of his statement when we were considering the question of costs, if you remember.

Mr. Belmont inadvertently created the opinion in the minds of you gentlemen, apparently, by your findings, that he rather opposed Government ownership of the canal; that he was entirely satisfied with the results of the canal to date; that he had experienced no disappointment in what had occurred to date, either in cost or in the results of the operation of the canal. What Mr. Belmont intended to say was this, and he has coached me very carefully upon it, so I think I can tell you just exactly what he requested me to say to you. At the time this project was brought to his attention he quite naturally had very careful investigations of it made. He had prominent engineers to make a very careful study of it; he had commercial experts make a very careful study of it; and as a result of those investigations he concluded to go ahead with the project. His conclusions were based upon what he had learned through investigations and on prognostications made to him and his advisers as to what the canal was capable of doing in the way of earnings.

Mr. Belmont realized, having had many years of experience in the public utility business, that no public utility starts off the day after construction is completed to pay its way. Such public utilities are without my knowledge. I do not know of any electric light company, any gas company, any electric railway or steam railway that is a financial success from the day it begins its operations. Mr. Belmont realized and his associates realized that there would be a period of time required in which to develop the business of the canal. He was not unmindful of the well-known fact that the mariner is perhaps the slowest of all individuals to make changes from the beaten path. We are all more or less victims of habit. We all take usually the same route to our homes after our day's work. We usually take the same route coming down in the morning, and the mariner more than any other class of men accustoms himself to a particular route, and it is difficult to change him. He does not like to go into unknown waters.

The master of the vessel is in control from the time he sails. There are two reasons why the owner of the vessel does not specifically direct his master as to route. In the first place he wants the responsibility for the safety of the ship and the safety of the passage on the shoulders of the master. Secondly, if he directs the master specifically over any particular route, he vitiates his insurance. Hence, our work of establishing the business has been very largely among the masters. We have had innumerable owners to say to us: "Yes, we would like very much to use the canal. We think we ought to use the canal. We think it would be good economy to use the canal. We think it would be much safer for us to use the canal. But that is a matter that must rest in the hands of our masters. They have been traveling up and down the coast for amny years. They know the route and they have had the experience, and we do not care specifically to direct them how to use the canal."

What Mr. Belmont intended to say to you was this. The prognostications he made at the time he entered into this venture, based upon normal conditions—no war was in sight, either in Europe or here; we were living in peaceful times; our business was in a normal state. He believed that under those conditions as they existed a certain period of time would be required before he could build up the business of the canal. He meant to convey to you that he had not been disappointed in that. He had no expectation of making money from the start. In his communication to the Secretary of the Navy he stated that the canal at that time was earning at a rate of over 400,000, odd dollars which would enable him to pay his operating expenses, the interest on his bonds, and leave a little something over. That statement was true. He had at that time a contract with the Eastern Steamship Co. alone paying him $236,000 a year for the passage of the Bunker Hill and the Massachusetts. Both of these vessels were subsequently taken over by the United States Government, and two smaller vessels were put on the line in their place, which cut the earnings of the canal to about one-half. He had a very large small-craft business. He had a large amount of yacht business the first year of the operation of the canal, and our earnings from the yacht business alone was very considerable. All that business, due to war conditions, practically disappeared, and what Mr. Belmont attempted to say to you was that conditions over which he had no possible control had robbed him of his expectations in the canal. The canal has not come up to the expectations of those who established it and went into it, but it is due not so much to a mistake in calculation which Mr. Belmont was very anxious that you should understand that he had not made a mistake in his enterprise, but circumstances over which he had no control had been disappointing.

Mr. Belmont has always believed that the Government should have built that canal. He has always believed that ultimately the Government would take over the canal. At the time the canal was built he made a proposition to the Govern-

ment, and I am going to take the liberty of reading into the record just a few short extracts here from a speech Mr. Belmont made to the Atlantic Coast Inland Waterways Congress on December 7, 1911. These extracts I will read indicate very clearly Mr. Belmont's attitude at that time on the question of Government ownership and operation of the canal.

Col. ROESSLER. To whom was that addressed?

Mr. WILSON. This was addressed to the inland waterways congress on the 7th of December, 1911. I am going to read these extracts, and I am going to leave with you a copy of Mr. Belmont's entire speech delivered at that time:

"During the war of 1812, the Canal Isthmus was frequently used for the transit of merchandise to avoid capture by the enemy's cruisers on the coast. Here is a distinct forecast of a security demanded for a vast commerce plying in the same directions to-day."

Indicating, in 1911, Mr. Belmont's foresight of the possible use of this canal.

Further on in his speech he made this statement, referring to fogs and the difficulties of navigation around the cape:

"These elements, added to the saving of 70 to 75 miles in actual distance for all ports, mean a greater reduction in the equipment necessary for carrying the same volume of business, resulting in relative saving on all manner of dock, anchorage, and other charges. Reduction in insurance rates will also figure as an important factor."

This prognostication made in 1911 was fortified by this testimony you heard yesterday:

"The prism of the canal is fixed in our contract with the State of Massachusetts at 25 feet at low water and 100 feet wide at the bottom. These dimensions are ample for all vessels plying in our coastwise trade."

That statement was practically true in 1911.

"In fact, they conform to the maximum requirements, as I understand, in such plans as have been made for inland waterways along the coast south of the port of New York. They are ample for all commercial requirements, but I would be violating my duty as a citizen if I refrained to-day, even at the risk of being misunderstood as to my meaning and motives, to speak of the possible use, in time of war, the Cape Cod Canal might be obliged to serve."

Going on further:

"I repeat, the present canal, as planned, is ample for all purposes commercial. We are satisfied with it, need no help to construct it, and want none. But what would happen should the Government decide that the canal must be capable of floating war vessels? Deepening to 34 feet at low water would be necessary to provide this. Unfortunately, the day will soon pass when it will be possible to accomplish it without enormous added cost for construction and great interruption to traffic, if such a decision is delayed beyond this year."

This was in 1911.

"The fact was brought to the attention of our Government last year that the construction of the Cape Cod Canal was a definite reality; that it would probably be completed by 1913; and that the cost of widening and deepening it to dimensions which would admit of the passage of our dreadnaught class of warships would not exceed three millions of dollars if the decision was reached and the work of widening begun before the spring of 1912."

Meaning by that before the construction of the canal as planned had gone too far to enable that additional work to be done economically.

"I have heard nothing further on the subject and presume the use of the canal for such a purpose is not considered advisable by our best authorities in such matters. Should time change this opinion and action become necessary, I wish to make this record of our readiness to cooperate and perform our part of such a change."

And concluding, he said:

"We are zealously performing our part of the work on the cape, and it is for you"—

Speaking to the inland waterway's congress—

"to push for the deepening of a continuous waterway along the Atlantic coast."

Mr. Belmont made a speech to the chamber of commerce of the city of New York at a regular meeting of the chamber held on June 4, 1914. I will just read one extract from that speech as indicating to you the attitude of mind Mr. Belmont has always had relative to this canal and to the Government connection with it. He says:

"The construction of the canal under the contract involved the construction of the highway bridges across the canal by the canal company, or the construction company; also the railroad bridge and also the construction of the adjacent highway. All of this work has been done, and bridges crossing the canal, which are two, one at Bourne and the other Sagamore, are so constructed that at any future time the

canal can be widened 200 feet and deepened to a depth which would carry the largest vessels afloat. This provision was made by the company of its own volition, seeing in the future the possibility and desire on the part of the Governemnt to be able to move its war vessels through the canal."

That was a speech made in 1914.

Now, in the findings of this board the statement has been made, very properly so from your misunderstanding of what Mr. Belmont attempted to convey to you, that the owners of the canal were rather opposed to the Government taking the canal over. I want to say to this board that that is not the attitude of the canal company. In fact, to be perfectly frank and perfectly honest, we feel that the Government should take the canal over. We feel that the job is too big for us. We can not handle it. In peace times we had an opportunity of working on a situation which we believed was a good one, but the war has changed all of that. It has been difficult for us to get labor. It has been difficult for us to get materials. It has been absolutely impossible for us to get equipment to maintain the canal. The canal was built for a 25-foot canal. There has been a very short period of time that we have been able to maintain 25 feet, even where we could get equipment for work on the shoals.

Col. ROESSLER. May I ask a question at this point?

Mr. WILSON. Certainly.

Col. ROESSLER. Apropos of what you now say regarding Mr. Belmont's meaning, I have in mind a statement that was made at the previous hearing—I do not recall who made it—a statement to the effect that Mr. Belmont and his associates were satisfied that they had a good investment, and that the proposition to sell to the Government did not emanate from the officials of the canal company. Is that the statement which you wished to correct?

Mr. WILSON. I think perhaps that statement, or a similar statement, was made by me. I do not recall what I said, but that statement may have been made by me. What I attempted to convey to the board was this, that there never had been a proposition made to the Government relative to the sale of the canal. In other words, negotiations looking to the sale of the canal were not begun by the canal company. Secretary Daniels, as I explained to you at that time, having passed through the canal, requested some data regarding the canal, and sent for Mr Belmont to come to Washington to see him. I came with Mr. Belmont on that trip, and the matter was discussed about three hours with Secretary Daniels, and he told us at that time that he felt that the Government should own the canal, and he wanted to thoroughly familiarize himself with it, with a view of bringing about an ultimate purchase of the canal.

Col. ROESSLER. Speaking for myself, the impression I got from that statement was that the canal company were perfectly satisfied to continue operating the canal.

Mr. WILSON. What I wanted to do was to make just this distinction. I may have had a false idea, perhaps, of its value, but we have been accused in various quarters; there have been statements made that a group of men in New York undertook a project; that the project had proved disappointing to them, and they found that they lost their money, that they had a white elephant on their hands, and they wanted to unload it on the United States Government. What I attempted to say was that there had been no attempt made by the canal company to unload the canal on the United States Government; that the negotiations now in progress, that this enactment by Congress, was initiated by the United States Government and not by the canal company.

I will say to you very frankly that the canal company were very happy indeed when those negotiations were initiated, but I wish to make just this distinction, that they were initiated by the Government rather than by the canal company, as a denial of those statements that have been made.

As I was saying when you asked me that question, it is quite impossible for the canal company to go much further with this canal. Conditions are such that we can not do it. It is not altogether a matter of dollars, although I am very frank in saying to you that the stockholders have put just about as much money into the canal as it is possible for them to put into it. I am one the stockholders of the canal, and I am very frank in saying to you that I have finally reached the stage when it does not suit my purposes to write my check every few months for deficits in this canal. We are working under conditions over which we have no control, where it seems quite impossible for us to increase our business and maintain our property under war conditions. Hence we feel that the United States Government is better fitted and better able to operate this property and maintain it and make it practicable for all possible uses than is private ownership and private capital, and we feel that the United States Government should take it over.

This recent enactment by the Congress provided that the Secretaries of War, Navy, and Commerce should negotiate a price for the canal. I think the question of the price of the canal is a matter in their hands. I am not denying the right or the duty of this board, perhaps, to advise relative to that feature. That is a matter entirely within your own decision. The act also provides that in the event of failure to agree upon a reasonable and fair price—that is, a price that in the opinion of the Secretaries is fair and reasonable—that an action of condemnation shall be begun. At the time that bill was drawn I was asked about the condemnation. We were perfectly satisfied with it, of course. It goes without saying we recognized the right of the Government to condemn in any event, and we are entirely satisfied to submit the question of the value of this property to the courts if a fair and equitable agreement can not be reached between the canal company and the Secretaries. We do feel, however, that the condemnation of the project as worthless practically to the commerce of the country, to the Military and Naval Establishments of the country, is rather unjust to the property. We would like to see a different recommendation. We urge upon you a different recommendation. We tell you very frankly that we want the Government to take over the canal, because it is too big a job for us. We can not swing it.

With that statement I will leave the matter entirely in your hands.

Gen. ABBOT. Judging from the newspaper reports the Government is said to have taken over the operation of the canal during this period of hostilities. What effect would that have on the canal company? If they are relieved from the burden of the war conditions then when the war is over they will find their canal in as good or better a condition than it is now, and why does not the investment go back as it did before, because if the Government takes and operates the canal it presumably will make fair payment for the use of this property, of which it has taken possession. Why does not that put the matter back exactly where it was at the time Mr. Belmont told us that he was not dissatisfied with his investment; that he believed that the canal would become under ordinary conditions a paying business investment and consequently has not the Government by its action at this time put Mr. Belmont back into the exact place where he was when he was satisfied with the proposition?

Mr. WILSON. It may be, gentlemen. That is a difficulty too uncertain. That is assuming that conditions after the war are going to be as favorable to an enterprise of that character as they were before.

Gen. ABBOT. Does not that hold good about every investment that every moneyed man in the United States has made in everything? After the war is over conditions are going to change.

Mr. WILSON. Yes.

Gen. ABBOT. Why is it not, then, on the same basis as all of the rest of the large public utility business in the United States after the war is over?

Mr. WILSON. It may be.

Gen. ABBOT. The railroads, the telegraph, and this canal are all on all fours in regard to this matter, so far as I can see.

Mr. WILSON. It is rather difficult for me to make a forecast as to what that condition might be. I do not mind saying this. The President's proclamation calling upon the Director General of Railroads to operate this canal also directs the use of the canal by certain shipping concerns. I think possibly the proclamation names the Oceanic Steamship Co., the Clyde Line, and other lines to be routed through the canal. I am perfectly frank in saying that, in my opinion, that is going to do more within a week to educate the mariner to the use of the canal than we could do in 10 years. Unfortunately we have not had that power. We could not say to the steamship company, "You shall route your vessels through the canal." We could not say to the master, "This particular route you have got to travel." He has been slow to take the canal trip. Now Uncle Sam is going to see to it that he does take the canal trip, and I have no doubt in my mind that if the canal is properly maintained and well operated, as it undoubtedly will be under the Railroad Administration, the great bulk of the Atlantic coast commerce will become accustomed to the use of the canal. They will know the canal, they will know the route, and I believe that they will be satisfied with it.

But just what general conditions will be after the war I am quite unable to prognosticate. I can not tell. You may be possibly right. No doubt you are right as to your views of the situation. Nor can I combat them, nor can I agree with you, because it is a matter that would require a great deal of study on my part to even express an opinion about it.

Col. NEWCOMER. Have you considered the canal maintained to its full present dimensions adequate to care for all of the coastwise traffic?

Mr. WILSON. Our experience has taught us that such is not the case. When we entered into the project we thought a canal of those dimensions would be ample for the great bulk of the Atlantic coast trade. We find this to be the case. It is quite natural, I presume, for the average mariner to desire just as much room as he can get.

As illustrating, I was very much amused yesterday at the testimony of Mr Austin, of the Eastern Steamship Co., that even if the canal were widened to 200 feet, he said that it should be a one-way canal with his particular vessels going through. That applies pretty generally to everybody who operates vessels. They want as much room as they can get.

We find, which we did not know before, that the factor of safety required by mariners is a most variable commodity. One chap wants a mile of seaway to operate in. He talks about great widths, so that if anything happens to him he has a chance to maneuver. Another fellow says, "I can get along in this passage very nicely." The men who have used it have gotten along very well with it. I think your experience in asking the questions as to the depth and width that the canal should have will give you very clearly an idea of what its proper proportions should be.

So that we find a demand greater than we anticipated, and I do not believe that a canal 25 feet deep and maintained at 25 feet deep and with a width of 100 feet will be found ample for the Atlantic coast traffic. I think the canal will have to be deepened and widened before a majority of the traffic can become accustomed to its use and find advantage in it.

Gen. ABBOT. In looking into this matter, in the first place, what investigations did the company make as to the capacity of a channel of that size to accommodate the amount of traffic that was spoken of yesterday as all going through?

Mr. WILSON. I think they made this mistake, General. They consulted owners and they should have consulted masters. We found in the testimony here yesterday these owners are not practical navigators, and their opinions vary very largely from those of their masters. They do not know much about it, as some of the owners told you yesterday. One man said he felt that 100 feet was enough, and another said two and one perhaps three. In the investigations made at the time, the master mariner or captains of the vessels should have been consulted more than they were. We dealt principally with the owner. We dealt with the business men we could reach on the spot. They apparently expressed an opinion offhand, or they apparently told us what they believed would be ample for their requirements, but that did not fit in at all with the requirements of their navigators.

Gen. ABBOT. The testimony seems to indicate that barge traffic has to wait for the favorable conditions of tide, which necessarily means a long wait if they come just too late on a tide to go through. If the entire barge traffic going around the cape had to go through that canal, it occurred to me that there would be such a congestion of barges waiting for that favorable state, collecting for nearly 12 hours, that it would be impossible to utilize that waterway for vessels running on a schedule like the steamers that want a clear way to go through and go through quick. Has that been looked into? Our question here is how much this canal is worth, and whether it can accommodate. The claim was made here yesterday that it would take that around-the-cape traffic. Would one canal 200 feet wide, 30 feet deep, in your opinion, based on the investigations your company has made, begin to accommodate that great traffic?

Mr. WILSON. I thing it would.

Gen. ABBOT. How many vessels a day going each way would you figure would have to go through that canal?

Mr. WILSON. I would prefer to give the opinion of an expert. Mr. Wright, the marine superintendent of the Railroad Administration, has just made a study of that subject, and if I remember correctly, his report to the Railroad Administration was that the canal is at the present time capable of 100 passages a day each way.

Mr. MAASS. 100 each way—200 a day.

Mr. WILSON. 200 a day?

Col. NEWCOMER. I understood it was 100 a day?

Mr. WILSON. I understood it was 100 each way.

Col. NEWCOMER. As I understand, he figures about four operating periods of six hours each, during which they could move about 25 vessels on each of those.

Mr. WILSON. I stand corrected.

Col. NEWCOMER. Although he was giving that opinion, I think that 200 a day probably could be taken through.

Mr. WILSON. I was speaking entirely of my recollection of the matter.

Gen. ABBOT. Mr. Wilson, I wanted to get just in connection with these figures a view of the people who have been operating the canal, based on what they have actually found?

Mr. WILSON. What I started to say was, we have found in our experience that the delay at the canal over a period of four years has been far less than vessels going around the cape, due to weather conditions. We have seen time and time again at Vineyard Haven 25 to 50 vessels delayed from 24 to 72 hours, awaiting weather conditions suitable for their passage around the cape. We have never found a time at the canal when there was any considerable number of vessels delayed over a few hours. They

do not all go at one time, but while there may be 12 hours, it is accumulating during that 12 hours, and they go through very rapidly, so that our experience has been that there is much less delay, and I think the records will show that there has been very much less delay at the canal than going around the cape. I believe the 200 feet width at the bottom and 30 feet deep will accommodate all the traffic. Of course, full-powered vessels go right through regardless of tide. It is simply those solid tows that wait these favorable conditions.

Col. NEWCOMER. Except, of course, they could not go through very well probably while the other traffic is going in the opposite direction?

Mr. WILSON. I think they could with 200 feet. The consensus of opinion of the masters I have talked to is that 200 feet wide would give an ample two-way canal.

Col. NEWCOMER. Your opinion, then, as an official of the canal company——

Mr. WILSON (interposing). Yes: not as an expert navigator, but as an official of the canal company.

Col. NEWCOMER (continuing). Is that if the property were to remain in the canal company's hands under normal conditions you would be obliged to widen it to 200 feet?

Mr. WILSON. There is no question about it.

Col. NEWCOMER. And possibly deepen it?

Mr. WILSON. We have learned that lesson. The canal is not big enough. The great demand is for a larger waterway, and that is not in our power.

Col. NEWCOMER. A great deal of light will be thrown on that question by the experience in the hands of the Railroad Administration, when you force a larger traffic through and find out the results?

Mr. WILSON. Yes, sir. I have been very much interested in watching it, because I will stake my head against an orange that that will be the result.

Col. NEWCOMER. Your own canal superintendent, who is a mariner, considers that the present dimensions are capable of taking care of the traffic?

Mr. WILSON. All vessels thoroughly understand the canal before they go there, but the inquiries come to us, and it is very seldom a vessel comes through the canal that is not of a proper draft. The master on a vessel knows of it before he gets there, and he goes around the cape unless he is sure before he starts that he can go through the canal. We send circulars direct to the owner, and we keep every body on the coast posted as to conditions on the canal. When there was dredging done, we very frequently notified them as to that fact. So that all the information goes out regularly from our office. I do not think I have anything further to occupy your time with, gentlemen. I wanted to make that statement, so that you would understand it. I wanted to correct the impression that Mr. Belmont specifically requested me to do. I hope I have made myself clear.

Gen. ABBOT. One question I would like to ask. If the Government decided, after having operated this canal and kept it up during the war, that the owners were entitled to have their property back, is there any probability that the company would then increase the size of the canal to what you say you are convinced it ought to be; that is, 30 feet deep by 200 feet wide?

Mr. WILSON. No, General. It is not in the ability of private capital to do that.

Gen. ABBOT. You have as much money in it as you care to invest?

Mr. WILSON. You can not figure it out to save your soul. You can not consider in the experience we have had in the collection of tolls the howl that has been made about what we consider a very reasonable toll and a toll that we must have. It is not in the power of the company to invest the additional money to deepen and widen that canal to make it a paying proposition. The canal company can never deepen and widen that canal.

Gen. ABBOT. Is your position, then, about this, that the demands of the maritime traffic through the canal will be so heavy that you can not put on that traffic a toll which will enable you to pay interest on an investment and give you a canal 30 feet deep and 200 feet wide?

Mr. WILSON. That is our opinion, based on the experience we have had so far.

Gen. ABBOT. As a financier?

Mr. WILSON. As a business undertaking, it is unsound absolutely. The investment is too great.

Gen. ABBOT. But as you said before, on a 25 foot deep by 100 feet wide basis, and the maintenance based on the experience you have had up to this time, you and Mr. Belmont think, that if war conditions were eliminated, it would have been a reasonable investment of your funds?

Mr. WILSON. I must correct you again. We did so when we undertook the project. We have found by experience that such is not the case; that we were mistaken. A canal 25 feet deep and 100 feet wide is insufficient to attract the traffic in quantity to enable us to make a return on the investment. We have learned that lesson.

Col. NEWCOMER. Is not the resulting conclusion from all of that that the canal is economically unjustifiable?

Mr. WILSON. The canal, from the standpoint of private enterprise——

Col. NEWCOMER. From any financial basis? No railroad would be constructed, of course, unless it felt that the traffic would bear the cost?

Mr. WILSON. Many railroads have been built that did not bear the cost.

Col. NEWCOMER. Through mistake of judgment?

Mr. WILSON. Through mistake of judgment. The same experience is being enjoyed by the canal company exactly.

Col. NEWCOMER. Nobody would attempt to justify such construction as a financial proposition?

Mr. WILSON. No; not as a commercial enterprise.

Gen. ABBOT. Then the United States, if it took it, must justify it absolutely on the basis of the greatest good, which is a very hard thing to put down in dollars and cents?

Mr. WILSON. I do not quite follow that line of reasoning. I do not think anybody at all familiar with the subject will deny the benefit not only from the standpoint of finance, not only from the standpoint of saving, but also from the standpoint of the destruction of life and property, that this canal is a benefit, is a step forward in the development of the resources of this country. If the canal had any merit at all when it was conceived—through all of these years, if it has had any merit—what merit must it possess in the light of our recent experience?

We are spending billions of dollars to build up the greatest merchant marine that the world has ever known. It must have tremendous merit under the conditions we are about to enter upon. The United States Government has spent these billions of money for this great merchant marine and this great Navy, and it would seem to me to be a short-sighted policy not to make some use of that merchant marine and that Navy, after it has been built, and it strikes me, without attempting to criticise anybody, that that is one feature that we are slumbering on. In New York City our harbor conditions have been tremendously congested for years. I do not see much provision being made so far for this tremendous merchant fleet we are building, and just what we are going to do with it I do not know, but something has got to be done if the Navy is to operate efficiently after we get it. We are turning ships out very rapidly now. I am interested in one construction company that is building ships, and we are putting them out every day, and our vessels are not anything for the United States to take care of in this great merchant marine. So it would seem to me, from the standpoint of the United States Government, the cost of deepening and widening the Cape Cod Canal and maintaining it for the use of this great merchant marine is a very small consideration. That is my opinion of it, from the benefits to be derived by the merchant marine and by the Navy and by the Army in time of war.

Can I be of further service, gentlemen?

Gen. HAINS. Anybody want to ask any further questions? (After a pause.) There seem to be no further questions.

Mr. WILSON. I thank you.

STATEMENT OF MR. EDWARD E. BLODGETT, ATTORNEY FOR THE CAPE COD CANAL CO. AND OTHERS, BOSTON, MASS.

Mr. BLODGETT. Mr. Chairman and gentlemen, I have one witness who promised to be here from Baltimore, Mr. Dougherty. He is in the towing business there. He has a very large towing business, P. Dougherty & Sons, and I telephoned him last night, but he said he could not possibly be here on account of the business of the company and the submarine trouble, and so forth. So he had to be there looking after his fleet. But, he authorized me to say that he was very much in favor of the Government ownership of the canal, and that he would use it for his tows provided it was widened and deepened, his figure for the widening and deepening being 200 feet wide at the bottom and 30 feet.

Gen. ABBOT. What is the depth that his fleet would draw?

Mr. BLODGETT. His barges draw all the way from 18 feet up to 24, and you will find that most of these seamen feel that they have got to have from 5 to 10 feet of water under their vessels. They may want a larger margin of safety than is absolutely necessary, but they have had so many cases of sheering, where the vessels go over shoals and of sheering with a cargo carrier with a barge tow, and it takes so long to get them afloat again that they are afraid to trust themselves under 5 or 10 feet under their bottoms at all times. That is why you will find practically all of them asking for more than I think you gentlemen think is absolutely necessary.

I have also communicated with Mr. Coria, of the Merchants & Miners Transportation Co., and he promised to come and he said that he could not come in these times

and they had just since this submarine appeared off the coast, ordered one vessel through the canal, and in view of what the papers said, they would probably have to order more vessels through there, but he said he did not think it was safe for their vessels to navigate the canal at the present width.

Those were the two men who were coming from Baltimore, but they are not here.

I have some letters which I would like to submit to the board. I have one letter from Mr. O. L. Alexander, manager of navigation of the Pocahontas Fuel Co., No. 1, Broadway, New York City. I asked him to come, but he could not, but he said that his vice president, Mr. Farrell, would undoubtedly be here. Mr. Farrell has not turned up; I do not know why. They have a fleet of steamers, but I do not know that they have any barges at all.

Gen. HAINS. I think they have some barges. I have seen their name on them.

Mr. BLODGETT. But they are building and have been building steamers carrying up to 6,000 tons of coal on the coast, and drawing from 22 to 25 or 26 feet of water. They have quite a fleet, and some of them have been taken over by the Government and some of them they are operating themselves. He says:

"I have your letter of July 17 and note that you expect to be in Washington on Tuesday, July 23, to attend a meeting of the Board of Engineers at No. 735, Southern Building, at 10 o'clock, in order to testify regarding the taking over of the Cape Cod Canal by the Government.

"I agree with you fully that this waterway should be taken over, rehabilitated, and be operated by the Government. I am very sorry it is going to be impossible for me to be in Washington. Mr. Farrell, no doubt, will be there, and I will call this matter to his attention and, if possible, have him attend the hearing."

I have another letter from Capt. Cherry, the superintendent of the Lehigh Valley Railroad Co., whom I had asked to come down. He is a man of long experience in this towing business and railroad business, and he writes on July 22:

"I was unable to comply with the request of the construction company that I attend a hearing in Washington, D. C., on Tuesday, the 23d, but am glad to give you my personal views regarding the Cape Cod Canal."

And, by the way, his company is the owner of the tug and barges that were sunk off the coast of Cape Cod last Sunday.

"We have used this waterway but very little, first because of tows, which could not be borne at the low rate of freights received for transporting coal to the eastern States.

"Second, because as at present arranged, it can only be used under favorable tidal conditions; or, in other words, in approaching the west end of the canal, we must wait for the last of the tide, which flows from east to west, pull against it for one to two hours before the tide is done and go through at or near slack water. This, I feel, can be safely done with three or four barges in tow, by properly bunching the tow. Westbound with light tows, can be arranged in the same way.

"In one instance, our tug Perth Amboy brought six light barges west through the canal successfully, and I feel that there is no difficulty in bringing the ordinary tow of barges, when properly arranged, and the tug waits for proper tidal conditions.

"What the canal needs in order to make it of real value to the shipping interests, is to be widened and deepened, so that it will accommodate all classes of vessels, and be made free. This, I feel, would result in cheapening the cost of transportation of coal and other commodities to and from the eastern States; would practically make a safe movement of the equipment via the canal, when it would be impossible to round the cape and greatly increase the tonnage without in any way increasing the present facilities."

That simply accentuates what some of the witnesses said yesterday, and I think they all agree, practically every one agrees, that the canal in its present condition will not safely accommodate, in the opinion of mariners, the coastwise fleet, not 50 per cent of it, but if it is widened and deepened, that then they would all use it, and if they used it, I think you all realize from the testimony what advantage there would be. You have only to go down on Nantucket Sound, practically any day in the summer, after an easterly wind that we have there for 3 or 4 days and sometimes a week at a time and see a fleet—a whole fleet of 50 or 75 vessels—start out from Vineyard Haven and go in a perfect stream around the cape where they have been held up for a week on account of the wind.

A heavy tow, unless they have a very powerful tug, will not attempt to go around in the face of an easterly. Schooners can not go around in the face of an easterly. Sailing vessels have got to wait for a favorable wind, and living as I do in the summer at Osterville, on the cape opposite Nantucket, we can see time after time a perfect stream of vessels going out after days of not having seen a vessel going to the east. On the other hand, we can see them coming down from the east to the west where they

have been held up on the other side of the cape in the face of adverse conditions, and it is, as Capt. Crowley said yesterday, a great place for mariners to go in and wait at Vineyard Haven. They say a sailor has a sweetheart in every port, and I guess they have them in Vineyard Haven, because it is a safe harbor and there is something doing all the time, but there is a tremendous delay which owners would not have provided they had the use of Cape Cod Canal, and the owners realize it.

Gen. ABBOT. Would not there likely be a similar congestion at the entrance to the canal?

Mr. BLODGETT. That might be, but vessels are right there in sight, and there is no reason for them not going through. They have not got any wind to hold them back. If it is an easterly wind at Vineyard Haven, a master will say that he could not go ahead and that it was not safe, and you gentlemen probably know that owners can not direct their masters when to go and what to do. If they do, they take the responsibility off the master, and they are not relieved by law from responsibility by error of judgment on the part of the master if they have ordered him to do a certain thing, and that explains why owners will not order their boats through Cape Cod Canal, and I believe that if the Railroad Administration orders these larger vessels to go through Cape Cod Canal, that the owners will refuse to allow them to go through there in spite of those orders.

Capt. Crowley told me yesterday that there were six colliers held up since Sunday that would not go around the cape and he had given them orders, contrary to the Railroad Administration's instruction, not to go through the Cape Cod Canal. When the railroad authorities had wired him in Boston to send them through the canal, he said to his captains: "Don't you go through the canal with those vessels." There is an actual act, and Capt. Crowley's brother represents the Shipping Board in Boston.

Capt. Crowley is managing the vessels for the Shipping Board, and they are right in touch with them all the time and very friendly with them, and yet they are mariners, and no better mariner has been before you than Capt. John Crowley, and he will not permit his vessels, like the Hampden and the colliers of 350 and 400 feet in length and drawing 20 feet of water or more, to go through that canal at the present time in its present dimensions.

Col. ROESSLER. Do you not believe they could go through with the aid of tugs if they were provided?

Mr. BLODGETT. They will not allow them to go through with anything. Of course, if the Government would take and put about four tugs on a vessel—two on the bow and two on the stern—so that they could handle them, they might allow them to go through; but this is the first time I have ever in any way represented the canal company. I have been against the canal company in every case they have had in Massachusetts. I have appeared against them and handled every case of accident in the canal, I think, since the canal was opened, and this is the first time I have ever in any way represented the canal people, and I know the conditions in the canal probably about as thoroughly as one could know them who has had no actual experience, and I have personally been on the canal a good many times for the purpose of trying my cases.

That canal, in my judgment, never was equipped and constructed before it was opened. The very first accident that came up—the case of the Watuppa—was a case in which she landed on a shoulder in the bank where mariners supposed and pilots supposed there was plenty of water and which had only 6 feet of water over it, as it proved after the vessel struck. That had been left there by the engineering department when they opened up the canal to navigation, and no knowledge of that was given to the navigating end of the canal company. That shoulder was about 30 feet in length, and it came from a place where they knocked out the wooden caisson, or whatever they call it, where they took that part of the canal and knocked out the wood and let water in, and this shoulder was at that point and it was left there.

The canal never was properly constructed. You know, gentlemen, just as well as I do, that after a canal is once opened and filled with water it is almost an impossibility to complete the construction with traffic going through all the time, and that is the way the canal started. That vessel, the Watuppa, was going through towing a barge alongside. There was a big, powerful tug, and there was a dredge approaching in one side of the channel.

Apparently there was plenty of room for them to pass. They had a tug ahead of the barge, also, to help keep the bow straight. Another big, powerful tug was lashed alongside the stern. They had her under perfect control, but they did not know of this obstruction, and in going by this dredge they struck this obstruction, and the tug went right up in the air and parted every line between her and the barge. The barge shot along and the tug filled and she shot over to the other side and became a total loss on the other side. She was finally raised, but it cost more to repair her than she was worth. The barge struck, but they got her through.

Then, it comes to the question of the colliers. They said that the water was open to a 25-foot depth at mean low water, and these colliers were solicited to go through—colliers like the William Chisholm, Mr. Willett's vessel. You remember Mr. Willett testifying before you yesterday. He had a vessel of 350 feet in length and with a draft of 18 feet 10 inches. She sheered, and the canal company claimed that the steering gear of the vessel was out of order. I assume that the court was right in deciding that the steering gear was all right and that it was broken by striking on the riprap after the accident, but the vessel sheered by reason of not having water enough and she became unmanageable, and they took her through at a very considerable tide and she sheered and they did not have time to correct it. She struck on the side, and the minute she struck on one side she was gone. You strike a vessel going through there on a current and going under her own speed in addition, so that she is making over the ground 6 or 8 knots, and let her strike a sharp rock on the bank, with four or five thousand tons of cargo in her, and you have got something doing right off.

The result of that accident was that Mr. Willett has never allowed another of his boats to go through there, and he never will as long as the canal is in its present condition—I mean the size of it, as navigators say that it is not wide enough to control the boat if she sheers, and you gentlemen know that any cargo boat is what the seamen call loggy that she is hard to steer. She is not like a yacht; she is not like a twin screw boat, like the Eastern Steamship Co.'s boat.

Gen. ABBOT. They turn on the bow instead of amidships?

Mr. BLODGETT. They are more apt to; yes. They take a sheer and they hold that sheer for a long distance, and the man puts his wheel over and she will come back and go the other way, but she will steady; and that is just what took place, according to the owners, I think, in the case of the Bay Port, which is another vessel which was later sunk there, caused, in the first instance, as the owners claim, by "smelling" the bottom. The court in that instance found that, although there was supposed to be 25 feet of water in the canal, there was only between 18 and 19 feet of water, and the vessel "smelled" bottom and sheered, but the court found that that was not the proximate cause of the accident; but the proximate cause of the accident was because the pilot ordered the helmsman to put his wheel hard, and he broke the sheer and he went to the other side, and before he could straighten it she struck the bank on the other side, and therefore the court held the canal company blameless for that accident, and the owner at the present time is out his vessel, which was worth at that time probably $250,000 or $300,000 or $350,000, and nothing doing.

That owner, Mr. Hawley, whom Capt. O'Donnell represents, will never send another one of his vessels through there under the conditions that the canal is in, even if it is 25 feet deep. In that narrow passageway he would not send them, because the mariners realize that a 100 foot width in the bottom of the channel with sloping banks and banks that have bowlders and rocks sticking out all along, is not a sufficiently wide channel. Blue prints were presented in that case, which show hundreds of rocks in the channel, and the canal's present situation in many ways indicates that they never intended to make it safe.

Col. NEWCOMER. What are these big bowlders?

Mr. BLODGETT. It is where sand has washed down and leaves the bowlders protruding.

Col. NEWCOMER. It does not refer to the riprap?

Mr. BLODGETT. No. It comes up through the riprap in places, and you would be surprised to see those bowlders, and if you did you would not blame navigators for not using the canal. I am not knocking the canal. I told Mr. Wilson when he first asked me if I would handle this matter for him as well as for the others, I said I would but I would only do it and only get up the evidence if I showed the facts and the conditions in reference to the canal and the difficulties of it and the reason why people can not use it and will not use it at the present time and under the present conditions, and why people want the Government to take it and to put it in proper condition so that it can be used, because as Mr. Wilson has very frankly told you, the canal company have come to the practical end of their pocketbook.

Now, it means simply this, that the canal is to be allowed to exist as it is and never be of any greater use to commerce or to the Navy, or it must be taken by the Government, which has got the money and which can afford to spend it—and we all pay taxes to the Government. It can afford to spend it for all of us and can make that a safe, practicable and efficient waterway to take the coastwise commerce and the whole of it, according to the evidence, will use it in case it is made and put in that condition.

Now, just a word in reference to what commerce would use it. I understand that one of the points on which you gentlemen are to report is as to that matter. I understand that Col. Shunk made a report, of which I have had some notes given me, in

which he stated that he sent out letters to a lot of people asking certain questions. He does not say how many letters he did send out, but out of the letters he sent out he only received 25 answers. Now, you all know how little faith is put in circular letters that are sent out, and how few people will answer them or pay any attention to them, and you all know what answers to questions of that kind mean. Now, I have brought here from Boston, New York and Baltimore the representative men of the largest lines of carriers and doing the largest business of any people on the coast.

Col. Newcomer suggested to me very kindly when he was at the canal that you gentlemen did not want to have a tremendous lot of testimony, that you would prefer to have statements and letters, and I stated to him then that I would try and limit myself to a few of the larger people, and I have done so, but if you gentlemen are not satisfied that the commercial interests along the coast want the Government to take this canal and to widen it and deepen it, and of course to make the tolls free, although that question is an after consideration with me—that is the thing that is to be determined after the Government has taken it over, and I do not know what they will do and I do not care personally as to the tolls—but to take it and widen it and deepen it and make it efficient, I can bring to you and will gladly do so every single man operating vessels on this coast, and I guarantee that every one of them will favor that proposition. I have never heard anyone say a word against it, and I will guarantee that every one of them will say, as the men all said yesterday, that if it were made efficient, 90 per cent, even 100 per cent, of the coastwise traffic and traffic from South America would use that canal. And I believe that is so.

Now, I do not know the cost of deepening and widening the canal. You gentlemen know that. You have had evidence on that, as I understand, at the former hearing. At least, you have had reports on it from your people. That is the question that has got to be determined. It has got to be reported on by you, but the thing I am interested in particularly is to show that the maritime interests, the commercial interests, not only the vessel owners but the cargo owners, the manufacturers, the consumers of the goods and all are interested in having this made a public waterway and made efficient and kept so, and we believe without question that the only way to do that is to have public ownership, and Mr. Wilson frankly says so.

One of you said yesterday that the canal company never had stated that they wanted the canal taken over, but Mr. Wilson was not present at the time that statement was made, and he said, "I will set them right on that," and I think he has certainly done so.

The situation as I look at it is just this. Every interest without exception wants the canal a public waterway. They want the Government to take it, make it efficient and make it efficient for the trade which would naturally use it, because that will build up that trade, and it will increase our coastwise traffic. It will increase our South American business. It will cheapen the cost of goods. It will cheapen the cost of the manufacture of the goods. New England is doing a large amount of manufacturing for war purposes. It will decrease the cost of that. It will make New England able to count on her fuel supply, and not have vessels sunk or held up going around the Cape.

Capt. Crowley told me yesterday that there was over 100,000 tons of coal held up by reason of the submarine last Sunday in going to New England ports, and held up for several days. If that had come about last winter, all of our industries and our electric plants and our railroads would have had to shut down, because we had in Boston not 24 hours' supply of coal at one time. That is an actual fact, from the statement of the Fuel Administrator published in the newspapers. If this stoppage had come in the wintertime, the time when we were short of coal in that way—and New England winters are pretty hard, as Gen. Abbot knows—everything would have stopped.

I do not believe for a minute that Congress, under the present circumstances, would not say, without a dissenting voice that that canal ought to be owned and operated by the Government.

I am not talking about what the price should be that is paid for it. I went before the Senate Committee for the Chamber of Commerce of Boston, and I stated there, as I have stated here, that I am not interested one scintilla in what is paid for this canal by the Government. It does not interest me. We have all heard talk about a job being put up on the Government to unload this canal on the Government. The canal company only want, as I understand it, what is right and fair under all the circumstances. They say very frankly that they have bitten off more than they can chew, and they have got under the present existing conditions so far and can not go any further.

Commercially we have had a taste of what the canal may do and how it may assist New England and the whole country. We want it made more efficient. We want it to assist to its fullest possible extent. We do not want it to assist only to allow box

barges to go through there and small boats and yachts and light boats. We had rather have a loaded boat come through bringing our cargoes of coal to New Engalnd, than have them go outside and be submarined and then come down light and be safe from the submarine. We had rather they would be lost light than loaded, because we need the coal.

I have not been able to get my coal yet for next winter. I have got some few tons, but if I do not get more I will have to shut up my house and go somewhere else next winter, and others are in the same situation.

Gen. ABBOT. There is one idea I have in mind. In the ordinary commercial transaction of business, when a utility has made an investment which is a poor investment of their funds, and they can not get out of it, does it not generally result in a receivership and the thing being taken over by a successor at a smaller price which will enable the successor to conduct the business on that capital without going beyond the capacity?

Mr. BLODGETT. I can only say this, that I know in New England you will never get any capital interested in the Cape Cod Canal as a private operation at any price.

Gen. ABBOT. What I was going to say was more on this line. I do not want to put anything unfair at all, but I am trying to think aloud; that is all. If the company is to be relieved of a bad investment of its funds, is it not fair for them to let the United States know the least price at which they would be willing to turn the canal over? The duty is put on us under the law to make an appraisal, and it is very hard to do it when the owners are unwilling to put a figure on their enterprise. We have a more or less definite statement that was made to Secretary Daniels, but as a board here we have had to work out from our own data, such as we could get, as well as we could, what would be a proper sum to pay for that canal. One of the things, in coming to a friendly agreement as to prices, is to know what both sides or each side would be willing to accept, and then you can approximate what is fair.

Mr. BLODGETT. I do not understand that you gentlemen have to put a price on the canal. I understood that the act says that the price shall be determined by the three secretaries with the company.

Gen. ABBOT. Yes, but it also says that we shall conduct our investigations under the same rules and regulations as for the other projects brought before the board.

Mr. BLODGETT. That is, for the question of determining certain questions which were referred to your board, namely, what benefit it will be to commerce, how much commerce will use it, and so forth.

Gen. ABBOT. It is not altogether clear what the meaning of the act is.

Gen. HAINS. This board is required to appraise the value. Look at the first part of the act.

Gen. ABBOT. It begins on page 13.

(Mr. Blodgett here read the act.)

Gen. HAINS. "Appraise the value," it says.

Gen. ABBOT. Yes—in the usual manner, it says.

Gen. HAINS. That is the point right there.

Gen. ABBOT. We have to submit our estimate according to the regular course as to whether it is advisable to do a thing or not.

Col. NEWCOMER. And the appraisal of the value.

Mr. BLODGETT. That is true, but I do not understand that means anything as to what shall be paid the canal company. It is only as a basis for the secretaries to use.

Gen. ABBOT. To get an appraisal of the value, it will be of immense assistance to this Board to know what the owners of the canal think it is worth, but we have not been able to do that.

Mr. BLODGETT. I said to you frankly that I am not interested in what amount is paid, but you can hardly ask a man to make an offer of his property for less than it cost him.

Gen. ABBOT. Sometimes he is very glad to get rid of it for very much less.

Mr. BLODGETT. Yes. If the United States offered him something different, he might accept it.

Mr. WILSON. Might I ask is that the policy of the Government in taking over properties of this kind?

Mr. BLODGETT. Or the canal might say "We will not take it" and then let the court determine it. That is every man's right, to let the court determine the amount to be paid under all the circumstances. If it goes to the court, then the court is to determine what is fair under all the circumstances. I assume that the secretaries will look at it in the same way. Whether they will agree to pay a million or two million or five or seven or ten or fifteen or twenty millions, I do not know. But it will be their duty to deal with the canal company, and you can hardly ask the canal company to say anything less than the actual cost that they have been put to in the construction of this

work, which we must all admit, while we did not all agree with it in the beginning and while personally I would have been against building the canal in the first instance, not realizing that a war of the kind we have got now would ever come, and not realizing the importance that I do now of this canal, I would have been against anyone building it at all, but Mr. Belmont did go ahead and build it They did put their money in there, and they took that much chance, and they have shown to us— coupled with after events have shown to us—the large value of this waterway in proper condition to the public. Now, I say under those circumstances the Government ought to take it and make it of the fullest advantage to the public that can be made, and they ought to pay these gentlemen whatever is right and fair between man and man.

Gen. ABBOT. This board, in making an appraisal, is trying in the best way we can to approximate in our opinion what would be a fair appraisal, and it is a very hard thing to do.

Mr. BLODGETT. I am satisfied the company will be perfectly satisfied with any figure you put in as being what in your judgemnt will be fair to pay for their canal. I am satisfied that they will be satisfied to have you make any figure you see fit on it, and they will be perfectly willing to take their chances, if they think it is not enough, in dealing with the secretaries or with the courts. So that that point, I do not think, need bother you.

Gen. ABBOT. I wanted to give the opportunity to the company among other things to present that matter if they wanted to. If they would make such a proposition—of course, can not compel them to do it.

Mr. BLODGETT. I should not suppose or suggest even that they make any proposition any different from what it cost them, so far as a proposition is concerned. What they would accept afterwards, of course I do not know.

Mr. WILSON. This is the first intimation I have had, General, that this Board wished us to do a thing of that sort. We have never been requested to do it. I want to deal perfectly frank with the board. We have been advised by our counsel, the best that we could obtain, that in due course we would be sent for in reference to that matter. We did not suppose and do not suppose now that we would be expected to volunteer any information or any suggestion in a matter of that sort. This board has never intimated to the canal company, in so far as my knowledge is concerned, that it wished them to do so. I stated the first time we came here that the canal comapny held itself in readiness to confer with this board at any time upon any subject the board wished to confer with us upon. Now, if it is the purpose of this board and the desire of this board to conduct a negotiation with the canal company as to price, and I would be very glad to come down here—

Gen. ABBOT (interposing). What we are seeking is the basis of an appraisal, and a suggestion from you would be a very good basis for that appraisal, in consideration of the general subject. That is the position I take. The final agreement is made by the Secretaries, but we are required plainly by the statute to make an appraisal for the assistance of the Secretary of War in the regular course of all river and harbor projects that come before the board.

Mr. BLODGETT. Is it not your duty to report what in your opinion it costs to do the work and what it would cost to complete the work?

Col. NEWCOMER. And of its value also.

Mr. BLODGETT. And what you think of its value.

Col. NEWCOMER. And we did ask you, Mr. Wilson, whether the canal company was willing to name a price, and you said it was not, except in so far as it had already indicated in its letter to Secretary Daniels.

Mr. WILSON. That is the point I am making. When the canal company was requested by Secretary Daniels to make a suggestion of price it did so. It submitted in writing a proposition to Secretary Daniels. It hardly seems to us, in our opinion and under the advice of our counsel, that inasmuch as we have submitted a proposition to the Secretary of the Navy, that we should submit to this board or anyone else another proposition until we have been specifically called upon to do so. We have had no indication that we were to modify our proposition.

Col. NEWCOMER. You had the report of the district engineer to the effect that the value, in his opinion, was something like eight or nine million dollars, and you knew that the board was considering the question as to what it should appraise as a fair value.

Mr. BLODGETT. Then I understood thay put in the cost of what they had paid?

Col. NEWCOMER. Oh, no. We had accountants to go into their books and report on the cost, and as I understood at that time this amount of about $13,000,000 was not set up as what the company would now be willing to sell the canal for, but as an indication that Mr. Belmont had given to the Secretary of the Navy as to what would be a fair price. In other words, there was nothing definite as being the price at that time.

Gen. ABBOT. If I recollect correctly, one of you stated that there had been considerable expenditure going on since, so that $13,000,000 would not be a proper figure now.

Mr. WILSON. I do not think I stated that. If I did, I will say now that we do not contemplate making any change in that figure. The point I had in mind was this: As I understood from the final conclusion of this board or recommendation against purchase at any figure, the board had figured that the canal had a value of $3,500,000, but they recommended against purchase even at that price. You remember I asked you in your office, Col. Newcomer, if the board did not think the Government should take the canal at three and one-half?

Col. NEWCOMER. I really think the board had not considered the purchase at that price, but the reason that the company expressed itself as dissatisfied was that the board in passing upon its value I do not believe contemplated that the purchase at that price was at all possible.

Mr. WILSON. The point I am making is this: I would not be here now if this board had recommended the purchase of the canal at one million, or at two, or at three and one-half. I believed that the time would come when we would have our day in a discussion as to what we should have, but this board recommended against the purchase at any price. We are perfectly satisfied, so far as we are concerned, to have you gentlemen in your report, if you think the canal should be owned by the Government and you think the Government should pay $50 for it, that is perfectly satisfactory to us. Say so. We do not have to take that figure. If we can not agree with the Secretaries when the negotiation assumes form, it is provided by the act that the courts shall determine what we shall have. What we are interested in, Colonel, is the recommendation that the canal be not taken over at any price.

Col. NEWCOMER. It seems to me, Mr. Wilson, that that point—you should be just as indifferent to the board on that question as upon the question of price, because the Secretaries determine the whole thing.

Mr. WILSON. It rather hurts my pride to have a recommendation of that sort. If the Secretaries should decide that the canal is not worth more than $3,500,000 and they would not pay anything more than that, we are left rather high and dry as to our security. We have no quarrel with this board, please understand, as to their opinion as to the value of this canal. Their opinion is just as good, probably, as anybody else's, but what we do urge upon the board is that they recommend that this canal be purchased at any figure they please, that the canal be purchased at any figure that they feel is right. We had assumed that in due course we would be sent for by the Secretary and he would say: "Here is what our board recommends. What have you to say?" We might accept or we might present some reasons or argument as to why we should have more. That is the way we felt, and that is why the canal company has not attempted to volunteer anything.

Gen. ABBOT. I am very glad I asked that question, because it has cleared up in my mind very much what the understanding of the canal company was.

Mr. WILSON. I hope it has. I do not want this board to feel that we have attempted to withhold anything from them. We desire to give this board anything that it wants. This is the first intimation I have had that this board desired anything further than we have already given.

Gen. ABBOT. You did not understand what we wanted to get?

Mr. WILSON. Apparently not.

Gen. ABBOT. We have tried to get your valuation of the property, because we see that there are two questions involved, one what it is worth to you and one is what it is worth to the United States. The property may be worth very much more to the owners than it would be to someone else. We are required to form a judgment as to how much the United States would be justified in expending in producing the improvements necessary. That is what this board has to do all the time.

Mr. BLODGETT. That is right.

Gen. ABBOT. We have got to put that report in, and in making our recommendations as to what is to be done—if there is a company operating a railroad up to the handle and supplying all the transportation that is needed and required at reasonable rates, then the question comes up to the Railroad Administration: should this be taken over by the United States because there are others that are not doing it, or shall we take some railroads and not others? That is the question that they have had to solve. And this is a similar question here. Is it to the interests of the United States to take this canal, or to let it be operated by the company that is now operating it?

Mr. WILSON. I think we can clarify that situation very simply.

Mr. BLODGETT. It seems to me the most forceful argument on that is the action of the President on the recommendation of the Railroad Administration yesterday in directing that the Railroad Association take over the operation of the canal.

Gen. ABBOT. That does not affect the question of public ownership.

Mr. BLODGETT. It affects very largely the question as to its importance to the public.

Gen. ABBOT. We do not question that. That has not been questioned.

Mr. BLODGETT. It is not the question of public ownership, of course.

Gen. ABBOT. It is the question of public ownership only that we are considering.

Mr. BLODGETT. As a basis of that public ownership, you have to consider the question of what the public wants and the importance to the public.

Gen. ABBOT. Oh, yes.

Mr. BLODGETT. And it seems to me that is answered by a higher power than all of us and answered conclusively, that for commerce and the war that is necessary. That is the only power under which the President could make his proclamation that it was necessary.

Gen. ABBOT. We do not question that.

Mr. WILSON. I think, perhaps, I can clarify this situation as it presents itself to the mind of Gen. Abbot. We have felt that we should have our money actually invested out of this canal. At the time of our discussion with Secretary Daniels, and perhaps our view of this situation is an accumulation of events that you are not familiar with—at the time we discussed the matter with the Secretary, he said, "I have not the slightest idea in the world if the Government should take the canal over we would agree on the price." He said, "Senator Weeks has talked to me about this matter, and if a bill is passed, how would you feel about submitting the matter to the courts?" I said, "If you are thinking that way about it, it is perfectly satisfactory to us, if we can not agree on a price leave it to the courts. We would be very glad to do so. If, after a discussion, after a hearing on our part, and you presented your view of the matter we can not agree, it is perfectly satisfactory to us to have it embodied in the bill to have it submitted to condemnation." That was done, and an appropriation was made to carry out the condemnation proceedings in the event of such a disagreement. Now, we had supposed that until this matter was finally disposed of that the question of the amount we would take for the canal was a closed book until we were sent for and the matter laid before us, and that is why we have laid nothing before you on that subject further than the letter to the Secretary of the Navy.

Mr. BLODGETT. Did not you put in the cost the amount of money you had paid?

Mr. WILSON. Oh, yes.

Gen. ABBOT. That is all in.

Mr. WILSON. The board ascertained that by chartered accountants that they employed, so that all of the figures are in the possession of the board.

Mr. BLODGETT. That is what I understood.

Gen. ABBOT. You see there is a difference between an appraisal and a cost account. That is the real difficulty in this whole matter. We have got to make an appraisal, and it may be appraised at one value while it costs a great deal more.

Mr. WILSON. I recognize that.

Gen. ABBOT. So, in order to enable us to perform our functions most effectively, that was one piece of information which would have helped us. That letter to the Secretary is in the line. From your point of view I can see that if the thing is to go to condemnation at any time it would be very undesirable for you to state a figure less than you think it is worth, on patriotic grounds or any other grounds, because that would cut you off immediately in the courts.

Mr. WILSON. Yes, sir.

Gen. ABBOT. I see your reason.

Mr. WILSON. There is nothing for us to do but to sit still.

Mr. BLODGETT. In other words, it is bad management generally for a man to bid down on himself, as I have said to many clients.

Mr. WILSON. I hope we have made that plain?

Mr. BLODGETT. I want to offer now a letter from Crowell & Thurlow, who could not come from Boston. They operate a fleet of about 10 colliers, and part of them now are operating for the Government across the water. They have about 10 or 15 sailing vessels also, and they say:

"In answer to your inquiry as to what we think would be necessary to put the Cape Cod Canal in condition to be beneficial to the merchant marine of the United States, we beg to state that, in our opinion, the Cape Cod Canal, to make it efficient for mercantile purposes, should be widened to a minimum width of 300 feet and dredged to a minimum depth of from 30 to 35 feet, and a lock installed at one end to obviate the current now passing through the canal, which is now of sufficient strength at times to make navigation dangerous.

"With the above outlines carried into effect, we are of a firm belief that the canal will be of great advantage to our coastwise merchant marine and efficient to the Government for war purposes."

They are the only ones who have suggested that there ought to be a lock, but this came by letter.

Col. NEWCOMER. One of them yesterday testified to the same effect.

Gen. HAINES. That is a bigger canal than anybody else has talked about?

Mr. BLODGETT. Yes, sir; that is 100 feet wider than anybody else has suggested.

I now have three letters coming from the Board of Trade at Wareham, Mass., signed by a lot of people down on the cape with reference to a steamboat landing, wanting to have a steamboat landing made in the Cape Cod Canal for freight and passenger service, and of course that would mean necessarily, I assume, Government ownership or control and operation of the canal. I will not read those, but I will offer them. The New Bedford & Agawam Finishing Co., the Wareham Board of Trade is another, and then the petition signed by 15 or 20 Cape Codders, and I will file these.

I will now read the letter, if I may, from Capt. Arthur Crowley, the brother of Capt. John Crowley who testified here yesterday. He represents the Shipping Board in Boston:

"In response to your inquiry as to my views of the value of the Cape Cod Canal to New England, I would state that if the Cape Cod Canal was put in proper condition, that is to say, increase the width to double its present size, and also dredged sufficiently to enable any of our coastwise steamers to proceed through this waterway without any danger of striking any obstructions on the bottom, I am of the opinion that about 25 per cent more coal could be landed in New England.

"At the present time, most owners of ships are afraid to allow their ships to pass through this canal on account of the dangerous obstructions. At the present time there is a considerable delay to vessels being held up at Vineyard Sound by the naval authorities on account of the recent submarine scare, which would be entirely eliminated if vessels could pass through this waterway.

"I would recommend that if this canal is taken over by the Government that when the work was started to increase the size, that the dangerous turns in this canal be straightened out and make a straight canal from Buzzards Bay to Massachusetts Bay."

I suppose he means by that what one of the other witnesses says about cutting off some of the sharp points.

"As a waterway for coal barges at the present time, it is being used considerably, more especially for so-called box barges that trade between New York and Boston. None of the larger barges are using this waterway at present on account of the depth of water.

"I heartily indorse the Government taking over this canal provided it will be put in condition to take any size vessel that trades in New England.

"If there is any other information I can give you, I shall be glad to go over the matter thoroughly with you at any time."

I also want to offer a resolution adopted on June 8, 1916, by the National Board of Steam Navigation, N. L. Cullin, secretary-treasurer. The resolution is, after the whereases, as follows:

"*Resolved*, That the National Board of Steam Navigation petition the War Department and Congress to take the necessary steps to have the United States Government acquire ownership of the Cape Cod Canal, making it a free waterway for the benefit of shipping along the Atlantic coast."

You have also, as I understand, the printed report of the hearing before the Senate committee in May last.

Gen HAINS. Yes; we have that.

Mr. BLODGETT. I want particularly to call your attention to the testimony that was adduced at that hearing, because a great many of the men who were there are not here. Some were and some were not. The testimony of Admiral Benson, Chief of the Office of Naval Operations of the Navy Department, who came there at the order of the Secretary of the Navy and testified, is to me of the utmost importance for you in your deliberations, if you have any doubt as to the desire of the Navy Department to have the use of this canal and have it owned by the Government. He says that "especially if the Hell Gate is deepened as now I understand it is to be deepened, the appropriation having been made, the ownership of this canal by the Government and its widening and deepening is indispensable."

I will not take your time, unless you would like to have me do so, to read the testimony in detail, but I do wish that you gentlemen would read the record, which is not very long and is, I submit, of the utmost importance if you have any doubt at all on the question of the advisability from a commercial or military point of view as to the Government ownership of this canal, not of the question of price, because, as I have said, that is a question that must ultimately be determined by the secretaries or by the courts, and that you in your report must make up your own minds on the figure that you want to recommend; but on the question as to whether or not this waterway should be taken by the Government and should be made efficient

for use to its full efficiency, is the important question in this matter, and on that I would ask you to read the testimony.

Mr. Wilson calls my attention to a letter by Gen. Black, which is on page 97 of the record at the bottom and running on to page 98, to which I wish to direct your attention. Next follows on page 98 a letter from Rear Admiral Colby N. Chester, of the United States Navy, in reference to the importance of the Cape Cod Canal for strategic purposes. There is also a letter from Rear Admiral Knight on page 100, and all of the testimony before the Senate Committee, and also the statement from Secretary Redfield on page 14, and I want to say this without reading it, that there are 106 pages of testimony of men who all went to the hearing without any interest except a public interest, so far as I know. I was a representative of the Boston Chamber of Commerce, and I paid my own expenses to come down here, and without exception—Senator Weeks, Senator Lodge, Admiral Benson, Secretary Redfield, and a great many others, among them Mr. Raymond, of the Clyde Steamship Co. and of the Mallory Steamship Co., who I think is the one that Col. Shunk in his report says is not favorable to the canal, but he appeared before the Senate committee and said that he thought it ought to be taken by the Government, and without dissent, every man there, without any private interests in the canal, without having a dollar of stock in the canal or being interested in the canal or the canal company, appeared and said that it was their opinion that it was of great importance commercially, from a military point of view and from a naval point of view to the United States, and that it ought to be taken over, and I submit that that testimony, which I understand has been filed with you——

Mr. WEBER. We have the record.

Mr. BLODGETT. It is before you then—is of the utmost importance and should be read and carefully considered by you in coming to your conclusions, if you have any doubt on that question. I do not know that you have.

Now, I have here a copy of a letter which I got from Senator Saulsbury, from Secretary Redfield, addressed to the Secretary of War, dated July 18, 1918, and this copy is unsigned but it is from Secretary Redfield to the Secretary of War.

Gen. HAINS. You had better have it signed, to certify to it?

Mr. BLODGETT (Reading):

"My Dear Mr. Secretary: Respectfully returning mine to you of 14 June, let me quote for a more complete record its first paragraph:

" 'Does not the German submarine activity on our coast sharply accentuate the need of taking over as soon as may be, the Cape Cod Canal and the Chesapeake-Delaware Canal, and possibly also the Delaware-Raritan Canal? Ought we not to take some steps to end discussions of this subject and get action?'

"With it is returned your memorandum for the Chief of Engineers of June 15, from which these words are taken:

" 'I confess I do not see how a change of ownership in these two canals would increase their availability for the use which the Secretary of Commerce has in mind unless some enlargements are proposed which can be rather speedily effected.'

"To this on 20 June the Chief of Engineers replied, saying, in part, of the Cape Cod Canal—

" 'The canal under its present ownership is affording reasonable accommodations for existing commercial, military, and naval needs * * * and it is inadvisable for the United States to acquire the canal at this time * * *. It is not apparent that the public ownership of either of these canals (Cape Cod, Chesapeake and Delaware, and Delaware and Raritan) is essential in the present emergency.'

"I return the original of Gen. Black's report, venturing to retain the duplicate for a use in connection with another report referred to below.

"Pursuant to your suggestion of 21 June, I offer the following comments, as you say, 'on the three projects,' first. That refers now to the Delaware and Raritan Canal.

"I will skip down to what he says about the Cape Cod Canal:

" 'But the larger question is that of the Cape Cod Canal. This, I note, is said by the memorandum quoted to be affording "reasonable accommodations for existing commercial, military, and naval needs," and the argument is therefore made that "it is inadvisable for the United States to acquire the canal at this time." '

"There lies before me a list of 11 large coal-carrying vessels which draw too much water to pass the Cape Cod Canal on a 25-foot depth. So far as these and others like them are concerned, therefore, no accommodation is rendered by the canal 'for existing commercial * * * needs.'

"The large Army transports which were repaired in Boston did not, on their way south, take the short time through the canal because they could not. In this respect, therefore, the canal did not afford accommodations for military need.

"No battleship or first-class cruiser can pass through it, even though the outside waters were infested by submarines, for it is too shallow; in this respect, therefore, it does not afford accommodations for naval needs.

"The argument that Gen. Black has himself used in favor of immediate Government operation of the Delaware and Raritan Canal, followed by the fact of such operation under his own charge, and the argument respecting the advantages of Government ownership made by him on the Chesapeake and Delaware Canal are applicable with even greater force to the Cape Cod Canal.

"In the two former cases private ownership has meant partial use far within the needs of the country for transportation. In the case of the Cape Cod Canal this is not only also true but on at least one recent occasion private ownership has meant the absolute stoppage of all use for a continued period. In the last winter the canal was closed for six weeks because outside of the canal in the approaches ice accumulated. There were no private vessels of sufficient capacity to keep the canal open. There were Government vessels available which could easily have kept an open channel, but they could not be used on a private waterway. Had the canal been Government property, the Department of Commerce could have kept it open had other means not been available.

"It is interesting to apply Gen. Black's statement, that the canal 'under its present ownership is affording reasonable accommodations,' to the above facts, but this apart, the attention of Gen. Black as chairman of the Committee on Inland Waterways, was, on July 12, 1918, called to the fact that it would be necessary to remove about 200,000 yards of sand from the prism and entrances of the canal in order to permit its use on the basis of its present size. Stated differently, there is by reason of private ownership of this canal a handicap to its use by reason of small recurring shoals which have reduced the minimum depth available throughout to 19 feet. Private dredges suited to such work exist and were it a Government waterway would be used. Private ownership, therefore, means a reduction of about 25 per cent in the capacity of the canal as regards depth, which under public ownership would be prevented by existing means.

"It is betraying no secret to point out that the Railroad Administration is arranging to shift the coal fleet of 70 barges and 11 tugs from Philadelphia to loading points in New York Harbor. This fleet now operates between Philadelphia and points north of Cape Cod. The present distance the fleet moves is 600 miles, the distance it will move under the proposed arrangement will not exceed 285 miles, a saving of 52½ per cent. This increases the coal-carrying capacity of this fleet about 1,500,000 tons annually by reason of the use of the canal, and not only gives the publicly controlled fleet of the Railroad Administration greater efficiency but relaxes the pressure on the Shipping Board. 'In other words, the change of the Reading fleet to the shorter route and the general use of the canal should fully solve the problem of water movement of New England coal.'

"Public control thus seems to promise here exactly the same improvement that Gen. Black promises for it in the case of the Raritan.

"Thus will be made good the statement which Gen. Black, when colonel, made as department engineer officer at New York, when on January 31, 1916, he wrote to the then Chief of Engineers, 'the Cape Cod Canal is open to commerce and has demonstrated its value although not yet improved to its full depth.' At that time he added 'detailed studies * * * have shown the great military value of the canal and I am informed reliably that studies by the Navy have led to the same conclusion.'

"It is interesting to find Col. Black then writing 'in my opinion, at some time it will be necessary for the United States to obtain this canal by purchase' and to find that he adds 'I believe further that the commercial as well as the military importance of the canal is such that this power (over bridges) should be exercised to its fullest extent.' There were no German submarines operating off our coast in 1916, no American vessels had then been sunk by them. There are such facts now. The canal does not give to-day full accommodation to commerce for reasons above stated. I am informed that if taken over by the Government it can, however, in 30 days be put to its maximum present capacity.

"Gen. Black has before him now a proposition to so use the canal as to 'solve the problem of water movement of New England coal' and it has been suggested to him that under possible public control a movement of, say, 100 vessels per day through the canal may be practicable.

"One wonders, therefore, in view of the suggestion that 'it is inadvisable for the United States to acquire the canal at this time,' what the conditions are which would lead Gen. Black to carry out his own expressed opinion that 'at some time it will be necessary for the United States to obtain this canal by purchase.' One wonders, though no one hardly ventures to suggest, whether the opinion of to-day has not some

bearing upon the price to be paid for the canal rather than upon the fact of the purchase thereof.

"May I pause a moment here to point out that by official order the port of Boston was closed on Wednesday, July 3, 1918, except for vessels passing through the Cape Cod Canal. This was because submarines were thought to be outside and for the time the canal was the only safe way out. That way to safety, however, was not open to a naval or merchant vessel of over 19 feet draft. Under public ownership it would have been open to such vessels, even had the canal not been enlarged. Under public ownership, furthermore, it is feasible, as all know, to make that way to safety in both peace and war open to all vessels.

"The chief commercial argument, however, for promptly taking over the canal by the Government is furnished by Col. Francis R. Shunk, Corps of Engineers, United States Army, in his memorandum dated May 13, 1918. In this he emphasizes the fact that the present canal is not adequate to the demand for its use. (Note Gen. Black's statement that 'it is affording reasonable accommodations for existing commercial' needs.) Col. Shunk shows that its commercial use would greatly increase were the canal deepened and widened and made free of tolls, as Gen. Black recommends should be done with the Raritan Canal and as only the Government can do.

"Col. Shunk gives as the reason why six companies 'do not use canal at all' the following:

"'The risk of navigation is increased by deficiency in width and depth,' and adds 'the tolls are too high.' He states that—

"'If the canal with its present dimensions were maintained by the United States, free of tolls, one steamer line * * * would use it to the greatest extent practicable; one would use it for all its steamers, about 16 passengers per week; one would probably use it at times; one is doubtful on account of risk, and three would not use it at all.' He also adds:

"'Three companies, operating altogether 28 steamers, state that their vessels do not use the canal and would not use it with its present dimensions, even if it were free of tolls.'

"Then he says:

"'One line with 4 tugs and 26 barges does not use it now because of unreasonable requirements as to damages, and would use it most of the time in the winter months and in bad weather in the summer months if it were maintained at present dimensions free of tolls.'

"This comment of Col. Shunk is noteworthy:

"'I think it is shown by the statement given that the canal with its present dimensions is of not much value to vessels that can make the run around Cape Cod with a fair degree of regularity, nor is it much better for the towed barge traffic, which aggregates about 5,000,000 tons. About 63 per cent of this tonnage can not use the canal at present and about 51 per cent would not use it if it were maintained with its present dimensions free of tolls.'

"It is hard to think of a better argument for the Government ownership of the canal and its prompt enlargement than this statement made in an adverse report in apparent forgetfulness of its bearing.

"If one considers how pleasing to the ship and barge owner is the past and possible present action of enemy submarines off Cape Cod, the arguments against owning the canal, because if it were owned it could be made to accommodate vessels that it can not now take, seem humorous.

"Col. Shunk furthermore seems oblivious to the fearful calendar of wrecks on the shore of Cape Cod. We, who recently had a lightship torn from its moorings and lost with all its crew by reason of ice in the tortuous channels which use of this canal would avoid, have a keen sense of the advantage it would be to humanity and to commerce to have it open to the widest possible use as promptly as practicable.

"Col. Shunk argues the saving of cost thus:

"'As bearing on the question of reduction in cost to be expected from a free waterway, one company estimates that there will be a reduction of 5 cents to 10 cents per ton on freight; another estimates a reduction of 8 cents to 10 cents. Two expect a reduction of 10 cents per ton; one steamship company estimates a saving to it of $75,000 to $80,000 annually. Another estimates an average saving of $47 per passage on steamers averaging 3,200 tons, gross tonnage. Seven companies report that a free canal would save expenses, time, loss of life and property; that is to say, that it would reduce cost of transportation and insurance. One steamship company states that the outside route will cost less than the canal, and 10 companies do not answer the question.'

"Col. Shunk's report is emphatic as to the importance of greater width, less so as to depth. He tells that the president of the Eastern Steamship Corporation 'speaks

unfavorably of the canal in its present condition, but thinks that if widened and deepened and operated by the United States it will be of value.'

"He adds that,

"'James Hughes, jr., operating a line of scow barges through the canal, thinks that a free canal will be of great value to commerce,' and makes the significant statement that 'the traffic of his company north of Cape Cod has developed as a direct consequence of the opening of the canal.'

"After reciting, with apparent unconsciousness, reason after reason for the canal being made available to commerce on an adequate scale, he concludes by saying, 'I do not think that the canal can be considered a success.'

"It was outside of the waters avoided by the canal that U–53 sank a number of vessels. Were an American naval ship bound south from either the Boston or Portsmouth Navy Yard, she must needs pass, for lack of depth and width in the canal, through the very waters in which the submarine operated. Were a deep Government canal a fact, those waters would be avoided and a clear passage in safe inland waters, easily capable of protection against intrusion, would exist.

"The objection may be urged that arguments cited above for taking over canals into Government control during the present emergency do not apply with equal force to Government ownership of those canals. The answer is easy. Private ownership has had its day and failed. It has shown that Government control means an immediate large increase to the service rendered by these canals, even as they are. The only way to secure permanent full Government control is Government ownership. If the present inadequate canals are to be made such as will serve the national needs no one is bold enough to suggest that this can be done under private ownership and control. Our two greatest canals are respectively the Panama Canal and New York State Barge Canal, one nation owned, the other State owned.

"Finally, I believe that if the attention of the American people could for one full day be fixed on the fact that for an outlay of what perhaps it costs to run the way two days a safe channel, free from possible attack and from weather dangers, could be made for naval and merchant vessels from New England to Norfolk, they would not think kindly of him who suggested delay in bringing the matter about. This would especially be true if a photograph of the map made by the Engineer Corps, showing the wrecks on the coasts of Cape Cod, could be sent broadcast throughout the land, for they would then know that there is a human side to the problem.

"To be candid, my dear Mr. Secretary, I can not understand how any public officer having it in his power to promote a conclusion which would forever remove the menace of enemies and the dangers of the sea can fail to take the most earnest steps to bring that conclusion about. Is the expense of the war in the way? My answer is that it is the menace of the war which calls for this thing to be done, that the war against the dangers of the sea never stops. It has exacted its dead and wounded these many years past. It is time we stopped that conflict and ended these losses, for I know that you will agree that the life of a sailor and the safety of the ship on which he sails are of primary concern to the Nation, and if the Nation has in its power the means to put an end to the sailor's danger and to the risk of shipping, it ought not to delay in using that power fully."

I have read that quite fully, because it seems to me that it is about as good an argument as could be made on the importance of the Government taking over the Cape Cod Canal.

Gen. HAINS. You ought to have something on that to show who it is from. There is no signature and no date.

Mr. BLODGETT. My statement shows it.

Gen. HAINS. I know that.

Mr. BLODGETT. It is from Secretary Redfield.

Gen. HAINS. What I mean to say is that you had better have something on the letter itself to show.

(Mr. Wilson here presented a letter from Senator Saulsbury transmitting the letter referred to.)

Gen. HAINS. That is all right, but we haven't got it here. I speak of this because we had some question about one letter once before that came here without any signature.

Mr. BLODGETT. I can put on here at the bottom of this, if you want, "From Secretary Redfield to the Secretary of War."

Gen. HAINS. You can do that. That is all right.

Mr. WILSON. Mr. Chairman, it may be proper for me to state that this letter was given to me by Senator Saulsbury. The Secretary of Commerce had written to the Secretary of War on July 18th, transmitting a copy of his letter to Senator Saulsbury. Senator Saulsbury thought it might be of interest to this board to know some of the statements

in this letter, so he handed me the correspondence from the Secretary of Commerce and this copy was made so that the original might be handed back to Senator Saulsbury. I wanted the board to understand how the copy came here.

Gen. HAINS. That is all right.

Mr. BLODGETT. The only other thing I would like to file with you is the clippings contained in the two papers last evening with reference to the taking over of the canal by the order of the President and his order that the Railroad Administration was to have tugboats there to operate, and to make the canal by dredging a 25-foot channel and by ordering a certain type of vessels to use the canal, and it is that part I will read:

"Increase the present channel depth from 19 to 25 feet, which will permit of 10,000,000 tons of water-borne coal, now moving to New England ports, passing through the canal."

That is where I said that I know some of these colliers, although the canal is deepened to 25 feet but not widened, will not use that canal in spite of the Railroad Administration's ruling. Capt. Crowley told me that last night and ordered his boats not to go.

"Restoration of towage facilities withdrawn about a year ago.

"Establishment of additional terminal facilities at west end of the canal and a special towing service from Buzzards Bay to Boston and other ports north of Cape Cod."

I will offer both of these clippings.

If there are any questions anyone would like to ask, I shall be glad to answer them if I can.

Col. ROESSLER. Have you put yourself on record anywhere giving your opinion as to what should be the dimensions of that canal? You have introduced a good deal of testimony, but I would like very much to have you express your own personal opinion with respect to that matter?

Mr. BLODGETT. I am very glad to state my opinion. My own opinion is, if the canal is 30 feet deep at mean low water and bottom of the channel is 200 feet in width and the banks are in proper condition and with some line of buoys or guides installed to show where the bank begins and the bottom ends in a curving channel, that you will have a perfectly safe channel.

Mr. WEBER. That is for commercial needs and not navy?

Mr. BLODGETT. That is commercial needs. I am not speaking from the naval standpoint. I speak simply from my experience over the whole time the canal has been in existence, and as I have said, my experience has been on the other side and trying to show where the canal was not in proper condition and why those vessels were injured, and trying to have them pay damages, and it is on my advice that these large colliers have stopped trying to go through there. I advised Mr. Willett, after the Chisholm was sunk "Don't you ever send another boat through there until the canal is widened and deepened and properly marked." I said "if you do, the canal company's attorneys, if they know their business, will claim that you are half at fault in letting your boats go through there." That claim has never been set up, but if I had been their counsel it would have been set up.

But I also believe, from my experience, that practically all of the coastwise tonnage and the tonnage from South America will come up through the canal provided it is 30 feet deep at mean low water, and provided it is 200 feet wide in the bottom of the channel, and provided that that channel is marked in such a way that a navigator coming in there will see when he is in that channel and when he is out of it.

In the case of the Watuppa, the canal company said that we did not stay in the channel of the canal and got on the bank, and I said "How can you tell where the banks are? How can you tell when you are exactly in the middle of the waterway?" I said "With the curving, you can not tell when you are in the channel or how near you are to the banks." They said, "We can not pretend to be answerable for the banks. We know there are bowlders in there, but the channel is all right." To speak profanely, how in the hell a man can keep in that place I do not know, and that is practically what I said to you, Col. Newcomer, when you were down there. They ought to mark it so that it can be seen.

I do not suppose that a 30-foot channel is deep enough to take the big navy vessels. I do not know their draft, but I think all the colliers can go through on 30 feet mean low water, although some of them draw 27 feet. If they had a 200 feet width, those vessels would probably wait until the tide had risen a little before they would start to go through. They would not try to go through on the low depth of the tide, but if one of these cargo vessels has 200 feet width of channel—it is like a man learning to ride a bicycle. I had an innate desire when I first tried to ride a bicycle to go into the building or into the curbstone, and I would put the wheel over the other side, and I would go the other way. It is just exactly the same with a heavy cargo steamer. It is the same trouble with the barges. The barges are easier to handle, because if necessary the tug can go alongside of the barge and handle it perfectly

easily, but the steamer, if she sheers, you can not break the sheer except by her own power, unless you had a tug ahead of her.

I believe another thing, if the Government owns and operates this canal and puts it in that condition, that it can be navigated by ordinary mariners with a United States license, by having a line of buoys through the canal, then owners of tug boats will establish stations at each end of the canal, and there will always be plenty of power to help one through at a reasonable cost. I know men in Boston who own tug boats which they use for towing boats in the harbor, ready to help vessels all the time at a reasonable cost, and the Boston Tow Boat Co. originally used to keep them down at the canal. When they found that the canal company was not keeping the canal in proper condition, the Boston Tow Boat Co. would not keep its vessels there because it was not going to take the chances of injuring vessels going through a private waterway.

If that waterway were put in a condition, so that it could reasonably be navigated through and operated by the Government, there would not be any difficulty of that, and the private capital would put its boats there. The Railroad Administration would not have to put tow boats there. Private capital would do so.

I thank you, gentlemen, for your kindness.

(Whereupon, at 11.40 o'clock a. m., the hearing in this matter was concluded.)

FINDING LIST.

Page.

Accounts, examination of, by Price, Waterhouse & Co., Appendix A 40–66
Administration 61
Balance sheets 44–46, 64, 65
Breakwaters 50
Bridges 50–52
Buildings 56
Canal excavation 48
Cost of construction 40–42, 47, 59
Engineering 60
Equipment 56, 59
Ferries 58
Fiscal expense 61
Government and State inspection 60
Highway and fences 54
Improvements and betterments 59
Interest 62
Legal expense 62
Lights 57
Organization and promotion 61
Power and power houses 58
Railroad changes 53
Results of operations 42–44, 63
Signals and buoys 55
Slope protection 49
Telephone and telegraph 57
Ackernen, Henry, letter of 360
Appendixes:
A. Examination of accounts of canal company by Price, Waterhouse & Co. 40–66
B. Answers to questions asked by the Secretary of the Navy, containing data relative to dredging, estimates, bulkheads, maintenance, locks, fortifications, current velocities, fogs, weather conditions, winds, commerce, etc 68–75
C. Answers to questions asked by the Secretary of Commerce, containing data relative to earnings, maintenance cost, shoals, fogs, casualties, traffic, marine insurance, aids to navigation, tidal currents, tonnage, meteorological conditions, etc 83–384
C. Part 2, Daily reports of traffic of commercial vessels 105–276
C. Part 3, Hearing before Committee on Commerce, United States Senate, letters from interested parties, commercial statistics, and miscellaneous data 277–384
E. Fog record 384–385
Baker, Hon. Newton D., letter of 1–2
Barrett, John F., letter of 360
Barrett, J. P., letter of 361
Beardsley, S. N., letter of 361
Bell, J. W., letter of 372
Belmont, August, letter of 35–36, 338–341
Black, Maj. Gen. W. M., reports of 2–8, 30–31, 348
Board of Engineers for Rivers and Harbors, reports of 8–16
Bowers, Robert F., letter of 366
Bryne, J. L., letter of 371
Cadwalader, Wickersham, and Taft, letter of 375
Casualties 96–105, 353, 354
Chester, Admiral Colby M., report of 348–350
Chief of Engineers, United States Army, reports of 2–8, 30–31
Coakley, J. J., negotiations with De Witt C. Flanagan 385

Page.
Colbeth, N. L., letter of 368
Commerce, Secretary of, letter 35, 80, 290
Commercial statistics 2, 35, 66, 75–79, 87–92, 96–276, 314–316, 326–329, 342–345
Congressional authority for investigation 3, 8, 17, 20
Construction cost 40–42, 47, 59, 379–382
Cost, estimates of, for enlarging canal, etc 4, 10–16, 26–37, 39–40
Cost of construction 40–42, 47, 59, 379–382
Current velocities 23–24, 357, 366
Daily reports of traffic 105–276
Dalton, John W., letter of 369
Daniels, Hon. Josephus, letter of 66
Depth 21–22
Description 22
Dillon, M. J., letter of 359
Dimensions 21–22
Ernocke, Matthew N., letter of 358
Estimates of cost for enlarging canal, etc 4, 10–16, 26–37, 39–40
Examination, preliminary, report 17–19
Expenses, operation, and maintenance, etc 40–66, 387
Financial status 35–36, 40–66
Fishermen, letters from, testifying to the benefit and advantage of canal as harbor of refuge 358
Flanagan, DeWitt C., negotiations with J. J. Coakley 385
Fog record 85–86, 384–385
Hansen, S., letter of 360
Hearings:
Before Committee on Commerce, United States Senate, May 28, 1917 ... 278–355
Statement of—
Hon. John W. Weeks 279, 331
Admiral William S. Benson 279
Hon. Henry Cabot Lodge 283
Hon. William S. McNary 316
Hon. William C. Redfield 285
Mr. John N. Cole 292
Mr. Calvin Austin 294
Mr. Edward E. Blodgett 296
Mr. Edgar E. Lethbridge 299
Mr. H. H. Raymond 300
Mr. Eben S. S. Keith 303
Mr. O. H. Hageman 304
Mr. L. D. Dow 306
Mr. I. S. Buchanan 308
Mr. Gerry L. Brooks 310
Mr. John H. Pruett 311
Mr. J. C. Reichert 312
Mr. J. W. Miller 321
Mr. Jesse Baxter 330
Before Board of Engineers for Rivers and Harbors, April 23, 1918 388–410
Statement of—
Maj. August Belmont 388
Mr. J. J. Coakley 388
Mr. Horace T. Campion 400
Mr. Charles H. Innes 404
Mr. H. P. Wilson 405
Before Board of Engineers for Rivers and Harbors, July 23, 1918 410–501
Statement of—
Mr. Edward E. Blodgett 411, 486
Mr. Charles H. Potter 411
Mr. W. W. Willett 414
Mr. Jerome A. King 415
Mr. Calvin Austin 419
Mr. John N. Cole 422
Mr. Edward Page 425
Capt. Eugene E. O'Donnell 427
Capt. John G. Crowley 432
Lieut. Commander Thomas A. Scott, United States Navy 437
Mr. William S. McNary 439

Hearings—Continued.
Before Board of Engineers for Rivers and Harbors, July 23, 1918—Contd.
Statement of—Continued. Page.
Mr. William C. Brewer 443
Mr. John W. Dalton 447
Mr. Harrison Beardsley 450
Mr. Henry C. Cadmus 452
Mr. James Hughs, jr 454
Mr. A. E. Beck 457
Brief of the facts in support of Baltimore's applications for intercoastal barge service, by Mr. A. E. Beck 461
Statement of—
Capt. Harold L. Colbeth 463
Mr. Charles Maass 470
Mr. H. P. Wilson 474, 479
Mr. J. J. Coakley 476
History 20, 338
Hodges, H. F., letter of 346
Holman, S. M., letter of 371
Hughes, James, jr., letter of 313
Illustrations 66, 94, 278, 501
Insurance, marine 277
Investigations, prior 20–21
Keith, Eben S. S., letter of 370
Knight, Admiral Austin M., letter of 350–353
Kutter's formula, value of 23
Law, item of, ordering investigation 3, 8, 17, 20
Length 21–22
Lewis, M. W., report of 33–35
Maintenance and operating expenses 387
Makepeace, John C., letter of 370
Maps 66, 94, 278, 501
Marine insurance 277
Maritime affairs, letter of committee on 296
Masters, mates, and pilots, petition for improvements 362
Moore, W. B., letter of 310
Murray, Gen. Arthur, letter of 347
Navy, Secretary of the, letter of 66
Nelson, Charles, letter of 361
Nelson, John, letter of 360
Nelson, Nat., letter of 359
O'Donnell, William, letter of 359
Operating expenses and maintenance 387
Parsons, William Barclay, letter of 375
Petition of masters, mates, and pilots for improvements 362
Preliminary examination report 17–19
Price, Waterhouse & Co., examination of accounts, Appendix A 40–66
Prior investigations 20–21
Public hearings. *See* Hearings.
Redfield, Hon. William C., letter of 35, 80, 290
Riparian rights, opinion of eminent counsel 375
Rossell, Brig. Gen. Wm. T., reports of 17–30, 36, 75, 79, 82
Savage, Edward, letter of 366
Secretary of Commerce, letter of 35, 80, 290
Secretary of the Navy, letter of 66
Secretary of War, letter of 1–2
Shipwrecks 96–105, 353, 354
Shunk, Col. Francis R., report of 75–79
Silva, Manuel, letter of 358
Smith, Charles H., letter of 361
Statistics, commercial 2, 35, 66, 75–79, 87–92, 96–276, 314–316, 326–329, 342–345
Status, financial 35–36, 40–66
Stavey, Ernest, letter of 313
Story, Albert, letter of 361
Strategic importance 348
Survey 19–30
Thorndike, J. L., letter of 376
Tidal currents 23–24, 357, 366

Page.
Toll rates 87–92, 326–329, 342–345
Tonnage 2, 35, 66, 75–79, 96–276, 314–316
Traffic reports 2, 35, 66, 75–79, 96–276
Veeder, Robt. N., letter of 359
Velocities, current 23–24, 357, 366
War, Secretary of, letter 1–2
Width 21–22
Willard, Col. J. H., report of 31–33
Willard, D., letter of 291
Wilson, H. P., letter of 37–39
Winds 95
Wood, Gen. Leonard, letter of 346
Wrecks 96–105, 353, 354
Wright, George W., letter of 359

○